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his condemnation was brought about by suborned testimony.\*

Some robberies having been committed in the Mawills, Kristnaje and Wittoo Naik with some other Ramoossies were sent by Oomiah into that part of the district to seize the plunderers. The Naiks succeeded in seizing several of them, and after this service they returned to Sakoordy, and Oomiah had a chour (120 beghas) of land bestowed on him by Government in enam, and on the 17th January 1829, his pay was settled as follows, by Mr. Mills, the acting collector of Poona: Oomiah was to receive thirty rupees, Bhojajee twenty-five, five Naiks at twelve rupees, one Karkoon at ten, and seventy-two men at five rupees per month.

Oomiah (until about this time) had considerable suspicion with respect to the proceedings of Government towards him, still fearing that some treacherous measures were contemplated, and that he should be treated in the same manner that many of his tribe had been before him, by the former rulers of the country. He however gained confidence now that the pay of his Police establishment was settled, and was satisfied reliance might be placed with perfect safety in the faith of the British Government. He accordingly resolved on manœuvring so as to keep clear of all imminent danger, but at the same time to indulge in his old habits.

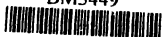
It is to be recollected he had been intrusted with the peace of the district, and with the lives and property of the inhabitants, but we shall presently see what was the flagitious line of conduct which he chose to follow, and the distress and injury he caused to many of the inhabitants from having been armed with authority as he now was at Sakoordy.

A considerable number of the unemployed and discharged soldiery of the country, and other needy persons, resorted now to Sakoordy, and Oomiah supplied them with grain for their subsistence. Many of these remained with him not only for days, but weeks and months, in the hope of getting employment through his favor. About the same time, Oomiah

listen to and investigate complaints made to him

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by some of the inhabitants, it mattered not what the subject of complaint was, whether on account of property stolen, or connected with quarrels of a domestic nature. All these matters he, with the assistance of some unprincipled persons who found it profitable to reside near him, settled in a summary manner. Koonbies, Ramoossies, Mhars, Mangs, and other persons of low caste, appeared before his tribunal for the redress of their grievances, and when they did not present themselves, on the circumstance of their complaint becoming known to him, they were in general summoned to Sakoordy: these people frequently came from the distance of fifteen, twenty-five, and thirty miles.

The complainants almost invariably paid a small bribe to Oomiah, or to those around him, to insure a speedy and favorable decision of their case; and after the trial was over, he was accustomed to fine the defendants a rupee or two, according to their means of payment. Sometimes he has levied five and ten rupees, and on several occasions as many as thirty and even sixty, and invariably exacted payment in grain. A decree was then granted to the parties; but the precaution was adopted, of taking a paper from the defendant, in which he declared that he was satisfied with the decision, and that he would never appeal to any of the Government authorities against the mode in which the business had been arranged. Oomiah moreover informed the parties, that if they acted contrary to their promise, they must abide by the consequence, for that they might rest assured of having their houses burnt, or some severe punishment inflicted on them.

It was customary for him to place under restraint such persons as resisted, or even evinced a disinclination, to abide by his judgment. In this way they were detained for several days, sometimes for a fortnight and even longer; and if deemed necessary, they were prevented going beyond the limits of the guard to eat their meals. In fact it may be said that the magisterial duties of the district around Jejoory, and part of the Indapoor Pergunna, were thus usurped by Oomiah.

The Rajah of Satara visited the fort of Singhur about the middle of the month of February 1829; on his return from place he halted at the village of Nussrapoor, a few miles

from Poorunder. Oomiah proceeded to Nussrapoor, and having been admitted to an interview with the Rajah, he submitted some of his sunnuds\* for His Highness's inspection; upon which Oomiah was informed, that if he had any claims within the Satara territory, they should be investigated, and should be restored to him, provided they were satisfactorily established. The Rajah happened to observe that Oomiah did not wear a turban, but merely had a kerchief on his head. He now mentioned to His Highness the circumstance of the loss of his cousin Raggoo (as before explained.) The Rajah seemed pleased with his explanation, and presented him with a turban and dress.

On the 2d of April a gang of Kykaries† plundered a coppersmith's house at Shikrapoor, a village twenty miles north of Poona. The following morning the Shikrapoor Ramoossies traced the gang to Loony, and succeeded in seizing one of them, with some of the stolen property. Oomiah's brother Kristnajee, was in the neighbourhood; he came and took charge of the prisoner, and proceeded with him to Shikrapoor, where the property was identified, and the necessary depositions taken, upon which Kristnajee proceeded with him to Sakoordy. Oomiah obtained information from this prisoner which led to the apprehension of all the rest of the party. He placed them all in confinement and after some days extorted a fine of four hundred rupees from them. Oomiah was accustomed to tell the owner of the property, that he was preparing the case in order to hand the robbers over to the Magistrate at Poona; he evidently however had no intention of acting up to his promise, for it appeared to him that these were a description of active, daring, and cunning rogues, whose services he could turn in a very advantageous manner to his own account. He therefore prevailed on them to reside at Sakoordy; osten-

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\* Credentials, deeds, grants, diplomas.

† These Kykaries had gone to Shikrapoor to capture, if possible, forty thousand rupees which some bankers at Ahmednuggur had forwarded to Poona; but they found the escort on the alert, and strong; they consequently retired, and proceeded to a copper smith's house, which they plundered.

The Kykaries are of a low caste, their occupation is basket making they lead a

sibly for the purpose of following their trade of basket making. Oomiah kept the stolen articles for his own use which they had plundered at Shikrapoor, the owners not daring to make any representation to the Magistrate on the subject.

On the 28th of June, Oomiah sent these Kykaries to plunder the houses of two Brahmuns at the small village of Pinggory in the hills south of Sakoordy. They secured gold and silver ornaments, with some clothes, altogether worth upwards of one thousand seven hundred rupees. The footsteps of the gang were traced the next morning into the boundary of the village of Sakoordy, and the Patell of Sakoordy was called on to deliver up the robbers, if he could not prove that they had passed beyond the limits of his village. The Patell consulted Oomiah as to what he should do: the latter demurred, consequently the Brahmuns went to Poona and stated the whole affair to the Magistrate.

The inhabitants of Sakoordy were now informed, that unless they could prove that the robbers had quitted the boundary of their village, they must according to the long established usage of the country, become responsible to the owners of the property for the value of the same; and Oomiah, whose duty it was to apprehend such delinquents, was directed to set diligently to work to seize them, or to recover the property. The villagers of Sakoordy entered into an agreement to make good the loss within the space of fifteen days, or to seize the robbers, and all returned from Poona to their village.

After a few days had elapsed, Oomiah sent a sepoy for the two Brahmuns and the Patell of Pinggory; and as they had been detained all day, they represented that in consequence of fasting so long they wished to return to their houses, which they were permitted to do. Being frequently annoyed and harassed in this manner, and obliged to feed the sepoys who came to summons them, they began to think it was hopeless to expect to receive anything from Oomiah, and they listened the more readily to his proposals in order to get rid of the trouble he unceasingly caused them. They therefore granted a receipt in full of all demands against the villagers of Sakoordy, and they were then permitted to rest at peace: they had however been previously warned against making any complaint to the Magistrate, and threats

were held out that their families would have cause to regret it all the days of their lives if they did so.

A Goossyne merchant was proceeding from Poona to the Karnatik with a large quantity of valuable cloths, and two days after he had passed Jejoory (the 14th of July, 1829) Oomiah detached fifteen Hetkurries and twenty Ramoossies in pursuit of him. This gang reached Lonud, south of the Neera bridge, at midnight, they instantly plundered the merchant of his property; cloths to the value of three thousand rupees were carried off. When the gang had reached the banks of the Neera on their return, they sat down to refresh themselves; as they were about to recommence their journey, some one of the party struck his foot against something that sounded like metal, and which on examination was found to be a small brass box, but empty. No one however would acknowledge having ever seen it before, although it was conjectured that it was part of the Goossyne's property, and that some one of the party must have helped himself to its contents. They carried the box with them, thinking that upon their reaching Sakoordy, the thief whoever he was, would be detected when they arrived. Oomiah and Bhojajee proceeded to a ravine in the hills, and the whole party were searched. To the astonishment of all, each of them took a solemn oath that he had never seen the brass box before, nor did he know anything regarding its contents. A piece of cloth ~~was~~ now presented to each of the party, and in the evening the rest was taken to Oomiah's house.

The gang were tracked to near Walla by the Lonud people,\* but no further: in fact the Ramoossies of this place were afraid to carry forward the footsteps to Oomiah's village. The Goossyne, however, repaired to Sakoordy and called on Oomiah to apprehend the robbers. He mentioned that the brass box that he had lost contained a few gold ornaments, some pearls, and a small diamond worth seven hundred rupees. The merchant's appeal to Oomiah was in vain.

Oomiah detached his Kykaries to Moregown or Moreshwur, on the night of the 31st July; they plundered two Brahmun's houses in that village, carrying off gold and sil-

\* Three of the Ramoossies of Lonud were wounded in defending this property.

ver ornaments from one house worth nine hundred and seventy three-rupees, and from the other, articles of the same description valued at two hundred and forty-six rupees.

Again, on the night of the 4th August, the Kykaries plundered a merchant's house of Belsur, near Sakoordy, of cloths valued at three hundred and forty-six rupees, which they handed over to their master.

On the 22d of August, Oomiah was sent for by the collector and he proceeded to Poona to pay his first visit to Captain Robertson, who had been absent a considerable length of time on sick certificate.

Oomiah was informed that his pay and that of his followers were increased, and their number augmented from the 31st of August, 1829. He was to receive forty rupees a month, Bhojajee thirty, ten Naiks at twenty rupees each, a Karkoon at ten, and one hundred and twenty-two Sibundies at six rupees each. Oomiah and his Naiks were on this occasion presented with cloths to the value of two hundred rupees. He expressed at the time, a great desire to have some copper-plate deeds restored to him which had been taken from him.

In the month of October, Oujy Naik of Oondry (a small village about four miles south east of Poona) having gained intelligence that a native banker of Kullian in the Konkan, distant seventy miles from Poona, kept a large sum of money in his house, started with a Bund of Ramoossies for Kullian, and on the evening of the 27th carried off twenty-nine thousand one hundred and fifty-four rupees. A few days after his return to Oondry, Oujy and several of his relations rode to Sakoordy and presented Oomiah with two thousand rupees, being the share he was entitled to of the plunder. This money was taken by Kristnajee to Bhewndy; the man who carried it groaning under the weight. I mention this, as Oujy was seized last year, tried at Tanna near Bombay for being concerned in the Kullian robbery, but was acquitted and sent back to Poona.

A Ramoossy brought information communicated by a Brahmun to Oomiah, that a considerable sum of money was about to be sent by a Poona banker to his agents in Bom-

bay, and that an escort of ten or twelve men would accompany the treasure.

Oomiah expressed a great anxiety to get this money into his possession, and prepared a detachment for the purpose of capturing it.

Suggun Bhow Hetkurry, with twelve of his men and a party of Ramoossies from Sakoorly, being joined by ten from Raak and ten from Oondry, proceeded with all secrecy and rapidity to a place beyond Chouk, ten miles from Tanwell; and about nine o'clock in the morning of the 29th of November, 1829, when the treasure party arrived at the spot near which the gang were lying concealed, the latter rushed on the escort and cut several of them down. The Ramoossies instantly unloaded the tattoos, and moved off with the booty; they proceeded to a hill only a few miles distant, and halted to rest themselves in a well-sheltered ravine, at a short distance from a cowherd's house. This cowherd had observed the Ramoossies, and went to Chouk and gave information to a Subadar of the 17th Regiment, who was posted there with a small detachment. The Ramoossies not suspecting any danger, and being fatigued, remained in the ravine without fear; and as the money was packed in large bags, they determined before proceeding on their march to make an equal division of it, that they might carry it home with greater facility; on this account, they had emptied out a considerable portion of it on a kumly, and were busy counting the amount by giving five rupees at a time to each man, when very unexpectedly they were assailed by a round of musketry from the detachment. Several of the most active Ramoossies seized the unopened bags and fled, pursued by the sepoys. The jungle was so dense, and they were so much below the sepoys, that none of them were injured by the fire of the detachment. The Subadar found about four thousand seven hundred rupees, which the Ramoossies were constrained to leave behind them when they were surprised. The gang upon reaching Sakoorly, delivered over upwards of six thousand rupees to Oomiah.

To Suggun Bhow and another Hetkurry he gave twenty rupees each, besides a silver ornamental chain to wear on their ancle. To the Raak Ramoossies he gave five hundred rupees, and an equal sum was declared to belong to the



Oondry Ramoossies ; Oomiah however said, that as the latter still owed him five hundred rupees on account of the balance of his share of the Kullian plunder, he should retain the five hundred rupees allotted now to them. In the hurry of their flight six of the Hetkurries left their muskets resting against some trees ; Oomiah consequently gave to each of these men six rupees, giving strict injunctions to them not to mention the loss of their arms, as he feared they might be recognized.

A banker named Baboodeo Tokykur on his way from Poonna on a pilgrimage to Kolapoor, having all his family with him, and an escort of ten Sibundies, halted at the village of Tambah a few miles from Salpie. Oomiah having had previous notice of this man's movements, had prepared a detachment of his men to plunder him when he had crossed the Neera. Accordingly on the night of the 24th January, 1830, the gang, composed of twelve Hetkarries, and nearly thirty Ramoossies, advanced to Tambah, attacked and forced the merchant's people to seek safety in flight. The women of the family were plundered of their gold and silver ornaments and clothes ; a number of copper pots were also carried off. When the gang returned to Sakoordy, both Oomiah and Bhojajee were much disappointed at their want of success, and became angry on the occasion with the whole party, telling them that they must have concealed the articles of value. Oomiah made them take a solemn oath on the Bell Bhundar, that their statement was true ; and then showed to some of them a list of the articles which the banker had with him, mentioning the quality and value of each. Oomiah observed that they were particularly unfortunate, at all events that they ought to have secured five or six hundred rupees worth of ornaments, whereas they only brought some copper pots and cloths, that might be valued at nearly three hundred rupees. The Naiks employed had concealed the gold ornaments. The banker's loss, and that of his women, amounted to three thousand rupees, and his followers lost property to the value of three hundred rupees.

*( To be Continued. )*

*II.—Description of Meteorological Instruments, and Instructions for making Meteorological Observations. By the late Dr. Alex. Turnbull Christie.*

Meteorology is the science which treats of the phenomena of the atmosphere, and the theory of climate. It investigates the constantly varying conditions of the medium, in which we live and breathe, the causes of the great varieties of climate from the poles to the equator—from the level of the sea to the summits of the loftiest mountains.—It enables the physician to detect the causes of many of the diseases with which we are afflicted, and thereby to guard against them. It points out to the botanist and zoologist the theory of the distribution of vegetable and animal species; and it teaches the horticulturist to raise the vegetable productions of distant countries, by means of an artificial climate, or gradually to acclimatize them under his own sky.

Independent of these applications to useful purposes, this delightful department of science possesses sufficient attractions, to be studied on its own account. It contemplates some of the sublimest phenomena in nature, and it will be found to display the same harmony, and the same proofs of divine wisdom, that pervade all the works of the creator. It has accordingly excited much interest in all ages and countries; but it is only since the end of the last century that it has been treated of in a philosophical and exact manner. Much has already been done by Saussure, De Lus, Humboldt, Leslie, Daniel, Dalton, and Anderson, yet, notwithstanding the labours of these distinguished men, the science may be said to be still in its infancy. Like other branches of natural history, it cannot be successfully cultivated by a single person; but requires the united exertions of numerous individuals, in distant and different climates, to make observations upon the same plan, and with nice Meteorological Instruments. To promote so desirable an object, I have drawn up the following instructions, which I trust may be the means of exciting an interest in the subject, and of inducing many to prosecute these studies.

The phenomena of the atmosphere are very numerous, and may be arranged under the following heads, viz. temperature, pressure, radiation of heat from the earth, light,

electricity, wind, moisture, and dryness of the air, rain, evaporation. To detect, and to measure these, the following instruments are employed: the thermometer, barometer, æthrioscope, photometer, electroscope, hygrometer, ombrometer or rain gage, atmometer. These I shall now describe; but must premise that all of them, with the exception of the æthrioscope, photometer, and ombrometer, ought to be placed in a situation where they will be completely shaded from direct, or reflected light, or heat, while, at the same time, they are thoroughly exposed to the wind. The best situation, therefore, would be the centre of a room having a thatched roof, surrounded, on all sides, with venetian blinds. It is not uncommon to place a thermometer against a wall, which, I need scarcely remark, is very objectionable, for the temperature of the wall, rather than that of the air, is thereby indicated.

**THERMOMETER.**—The construction of this simple and well known instrument requires no description, but as its scale is not always graduated in the same way, it will be necessary to explain the divisions most generally in use. The scale usually employed in England is that of Fahrenheit, upon which, the space between the freezing and boiling points of water consists of 180 degrees, and zero is placed 32 degrees below the former; so that the freezing point of water is 32° and the boiling point 212°. The scale best adapted for philosophical purposes is the centigrade, on which the freezing point is marked 0, and the boiling point 100; and all temperatures below the freezing point have therefore the sign minus. This will be found most convenient for meteorological observations, and I have therefore adopted it in the accompanying register and tables. The degrees of the centigrade scale may be converted into those of Fahrenheit, by the following simple rule. Double the degrees of the centigrade, subtract one fifth and add 32. Thus 20 of the centigrade is equivalent to 68 of Fahrenheit, for twice 20=40, subtract one fifth or 4=36+32=68. To reduce the degrees of Fahrenheit to those of the centigrade, subtract 32, multiply by 5, and divide by 9. Thus 68—32=36, which multiplied by 5=180, divided by 9=20. To facilitate these reductions table No. 1 will be found useful.

One of the most interesting questions in Meteorology is to ascertain the mean temperature of a place. The most accurate method would be to take a great many observations—one every hour or half hour, and to find the average of these ; but it would be quite impossible to carry this to any extent ; and various plans have been proposed to obtain the average temperature of the 24 hours, by means of one or two observations.—Humboldt says that between the latitudes of  $46^{\circ}$  and  $48^{\circ}$  the temperature at sunset corresponds very nearly to the mean of the 24 hours. Leslie supposes that the average may be reckoned from 8 o’Clock in the morning ; but almost all Meteorologists agree that the nearest approximation to the true daily average heat, is the mean of the maximum and minimum.

The author of the article Meteorology in the Edinburgh Encyclopædia, found from a great many observations, that the mean of the temperatures at 10 A. M. and 10 P. M. corresponded very nearly to that of the extremes, and consequently to that of the whole 24 hours. To ascertain whether this held good in other climates, as well as in that of Britain, I have made numerous observations at Malta, at Alexandria, at Cairo, at Thebes, at Darwar in the Southern Mahratta Country, and at Madras, and have invariably found that the mean of the two observations, at 10 in the morning and evening corresponded within a few tenths, and sometimes within a few hundredths of a degree, to the exact daily average, and was generally, much more accurate even than the mean of the extremes. In these instances I ascertained the daily average from hourly observations, and sometimes by taking the mean of the maximum and minimum of every hour. I find that the true daily average temperature determined at the Madras Observatory by Mr. Goldingham, by means of hourly observations, on 36 different days, in the year 1823, differs only from the mean temperature of 10 A. M. and 10 P. M. of the same days, by little more than 5 tenths of a degree, of Fahrenheit, or 3 tenths of a degree of the centigrade. Such being the case, I think we may reasonably expect that this law will be found to be universally applicable, and I have accordingly adopted these two hours for the observations of the thermometer, in the accompanying register.

In addition to these, the maximum and minimum ought always to be noted; which are most easily obtained by means of the self registering thermometer. This consists of two thermometers, one filled with mercury, the other with spirits of wine. The former has a small index of steel, which is pushed forward by the mercury, and is left at the highest point—the latter contains a small index of glass, which floats in the spirits, is dragged back by them, when they contract, and is left at the lowest point. The Instrument is set, merely by inverting it slightly. It may be observed and set every morning at 10 o'Clock, and the mean of the extremes noted, for the purpose of being compared with the mean of 10 A. M. and 10 P. M.

The BAROMETER measures the weight or pressure of the superincumbent atmosphere.

If a glass tube *a. b.* (Fig. I.) closed at one end, and about 40 inches in length, be filled with mercury, and then inverted perpendicularly in a basin of mercury *c*, so that the open end may be under the surface, the mercury will sink down from the upper extremity and stand at a certain point *d*, which will vary with every alteration in the pressure of the atmosphere. This is a simple form of the barometer. The mercury in the tube being supported by the weight of the atmosphere pressing upon the mercury in the basin, must evidently rise or fall, according as the pressure of the air increases or diminishes. The weight of the atmosphere, at the level of the sea, is generally equal to that of a column of mercury of the same base, and of the height of about 30 inches. It constantly varies, however, and to a much greater extent in cold and temperate regions, than within the tropics. Variations in the barometer are often connected with changes of weather; and persons who have been accustomed to observe it carefully, in certain situations, are often enabled, by means of its indications, to predict an approaching storm. But this is seldom the case in intertropical countries, where the rise or fall of the mercury scarcely ever amounts to more than a few hundredths of an inch, in the course of a day.

To measure the variations of the barometer a scale of inches and tenths, with a vernier, is placed parallel to the tube, and is reckoned from the surface of the mercury in

the basin ; but instead of being divided throughout its whole length, a few inches near the top are only marked, except in mountain barometers which require a scale of a much greater range.

To render the instrument portable, and at the same time delicate, various contrivances have been adopted. One of its most simple forms is that recommended by Delus, consisting of a bent glass tube *ab*, (Fig. 2.) closed at both ends, and with a small hole at *d* to admit the air. When inverted, the whole of the mercury occupies the long limb of the tube ; but when in the position represented in the figure, the mercury descends, and part of it flows into the short limb, until the column, between the upper surface *e*, and the lower surface *f*, exactly equals the pressure of the atmosphere. The length of this column is very easily measured by means of two scales on the brass case which incloses the tube, one of them being placed along the upper, the other along the lower limb, and the figures on which run in opposite directions, and require to be added together. This barometer is very portable, and (with the improvements that have been made by M. Bunten of Paris) is well adapted for the measurement of heights,\* but it is scarcely delicate enough for meteorological purposes.

Another form of the barometer is that in which the lower end of a straight tube, like that in the first figure, dips into the mercury included in a small cistern attached to it. In this case, it is evident that when the mercury descends in the tube it must rise in the cistern, and vice versa ; and accordingly, if the scale be fixed, the mercury will, in the former instance, stand at a higher point, in the latter, at a lower point, than it ought to do. In order to prevent this inaccuracy, most barometers are so constructed, that by means of a screw, the surface of the mercury in the cistern may be raised or depressed to the commencement of the scale.

As the mercury in the barometer expands by heat, a slight inaccuracy would arise in observations made at different temperatures, if not corrected. In order to exclude such irregularities, every observation might be reduced to what it would be at the freezing point of water (32° Fah-

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\* It may be procured, with its latest improvements from Mr. Robinson, Optician, 38, Devonshire Street, London.

renheit).—This might be very easily done with the assistance of Table 2,\* which shows the elongation of the mercurial column caused by different degrees of heat from 32° to 112° of Fahrenheit.† In the first column of the table is the temperature; in the line along the top is the height of the mercury in inches, and where these two intersect will be found the amount of expansion to be subtracted. For example, suppose the barometer to be 28.235 and the attached thermometer 70.5.—Look in the top of the table for 28, and in the first column for 70, and where these two intersect will be found the number 091, which subtracted from 28.235 leaves 28.144 the height at which the mercury would have stood at the reduced temperature of 32°.

In addition to the sudden variations to which the barometer is liable, it also undergoes regular periodical fluctuations, in all countries, but especially within the tropics.—It rises and falls twice in the 24 hours; and it has been ascertained, from a great many observations, that its two highest points occur in India very nearly at the hours of 10 in the morning and evening and its two lowest at about 4 o'Clock in the morning, and 5 o'Clock in the afternoon.—As so early an hour as four o'Clock in the morning would probably be inconvenient for most observers, I have substituted 5 o'Clock in the accompanying form for a register, which can hardly produce the slightest inaccuracy. The mean of the four observations will be very nearly the true mean of the whole day.

CETHERIOSCOPE.—In clear and calm nights, the ground, if freely exposed to the sky, is always colder than the superincumbent air, owing to the radiation of heat constantly going on from the surface of the earth, towards the heavens; which may be easily demonstrated by placing a thermometer on the ground, and suspending another several feet above it, when it will be found that the former indicates a lower temperature than the latter. If we now screen the ground by a thin awning of cloth, we check the radiation, and its temperature rises. It is to this terrestrial radiation

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\* I am indebted for this table to Mr. J. G. Taylor, Astronomer to Government.

† As all English barometers have the scale of Fahrenheit to their attached thermometers, I have adopted it in this instance, in preference to the centigrade.

that many important meteorological phenomena are owing. It is the cause of hoare-frost, and of dew, and even within the torrid zone, it sometimes causes a reduction of temperature sufficient for the formation of ice.—It is thus that ice is produced in Bengal, and not by evaporation as frequently supposed.

To measure this radiation, Sir John Leslie invented an instrument, to which he gave the name of *Cæthroscope*. (Fig. 3.) It consists of a differential thermometer having one of its balls in the lower focus of a polished metallic cup of an oblong spheroidal shape; while the section of a horizontal plane passes through the upper focus, and defines the orifice.—Having found this instrument exceedingly liable to derangement upon being moved about, I have contrived the following modification of it, which possesses the great advantage of being perfectly portable, and is equally accurate.—The metallic cup\* of Professor Leslie, is adapted to a delicate thermometer of the annexed form, (Fig. 4.) with the millesimal scale, and filled with colourless spirits of wine, so as to render it insensible to the rays of light. When this instrument is exposed to the open air, it will at all times indicate more or less diminution of temperature from radiation, which will be measured in millesimal degrees, by the difference between it and another thermometer shaded from the sky. It may be observed along with the thermometer at 10 A. M. and 10 P. M.; but, at the former hour, it will be necessary to shade it completely from the rays of the sun. The greatest degree of radiation, or the lowest depression of temperature caused by it, may be also easily ascertained, by having the *Cæthroscope* furnished with a small glass index, like that of the minimum registering thermometer, to indicate the greatest cold. Those who cannot procure the instrument I have just described, may substitute for it a common thermometer with a naked ball, placed on some cotton or wool on the ground, and freely exposed to the sky. When compared with a shaded thermometer it will indicate the diminution of temperature due to radiation, and if a minimum registering thermometer be employed in the same way, it will give the greatest de-

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\* This is generally made of brass; but silver is preferable, from being less liable to tarnish.



pression caused by radiation during the night. I need scarcely remark that this will not give such exact results as the more perfect instrument described above.

**PHOTOMETER.**—Of the various contrivances, for measuring the intensity of the solar rays, none are equal, in accuracy to the photometer of Leslie.—This is a modification of his differential thermometer, one of the balls of which is blown of black glass, while the other is formed quite pellucid. “The rays of light, which fall upon the clear ball, therefore, pass through it, without suffering obstruction; but those which strike the dark ball are absorbed at its surface, and excite or communicate heat. This heat must hence accumulate, till its subsequent dispersion through the air comes to balance exactly its constant accession. The space through which the coloured liquid sinks in the stem will thus measure the momentary impressions of light, or its actual intensity.—To prevent any extraneous agitation of the air from accelerating the discharge of heat at the surface of the black ball, and thereby diminishing the full effect, the instrument is always sheltered, more especially out of doors, by a thin glass case.”

The same objection being applicable to this elegant instrument as the *Cethroscope* of Leslie, I have been induced to substitute for it the following contrivance, which, although not so sensible to small impressions of light will be found to be fully as accurate. A thermometer, (Fig. 5.) with a millesimal scale, has a black opaque ball, over which is placed a glass cover fixed on by means of a screw. The difference between this instrument, when exposed to the sun, and one placed in the shade, will be the measure of the heat due to the rays of light.

Few accurate observations have hitherto been made, to ascertain the intensity of the solar rays, in different seasons of the year, and in different climates.\*—This is a branch of our subject, which presents a wide field for interesting research; and much curious information respecting the difference in the intensity of the solar rays, in the plains, and on the mountains of India, will probably be obtained by the employment of the instrument I have just described.

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\* Consult Daniel's *Meteorological Essays*.

**HYGROMETER.** Atmospheric air always contains a certain quantity of moisture in the state of vapour, which varies under different circumstances. It is capable of holding a much larger quantity at a high, than at a low temperature ; and this power increases in a more rapid ratio than the temperature. Thus at 0 of the centigrade scale, a cubic mass of air 40 inches every way can hold 100 grains of moisture ; at 5 of the same scale it can hold 126 grains ; at 10, 158.7 grains ; at 15, 200 grains ; at 20, 252.0 grains, and so forth. It follows that if air charged with moisture have its temperature reduced, part of this moisture must be precipitated ; and this, in fact, is one of the most frequent causes of clouds and of rain. By the accompanying table, No. 3, we find that air at the temperature of 25° centigrade is capable of holding 317.5 grains of humidity in the state of vapour, and at 15° centigrade, that it can retain only 200 grains. Accordingly, if air at the temperature of 25° and having its maximum of humidity cooled down to 15, it will discharge 117.5 grains of water, which will appear under the form of dew, fog, rain, or clouds, according to the situation and circumstances in which it may be placed. Again, if two currents of air having different temperatures, and both fully charged with aqueous vapour, meet and be mixed, a quantity of their moisture must be precipitated ; for, since the humidity increases in a more rapid ratio than the temperature, the mean of the former must be greater than that of the latter. For example, let us suppose that a current of air of the temperature of 25°, meet another current of the temperature of 15° and that both are fully charged with moisture—when mixed their mean temperature will be 20°. Now, if we consult the table, we shall find that air at 25° can hold 317.5 grains of moisture, and at 20°, 200 grains, the mean of which is 258.75 ; but at the mean temperature of the two currents, viz. at 20°, air can only contain 252 grains ; therefore 6.75 grains must be precipitated ; and it is in this way that clouds and rain are frequently formed.

It may be remarked that there are two ways in which air may be rendered absolutely humid, viz. either by adding

more moisture to it until it receives the maximum it can hold at its actual temperature, or, by reducing its temperature to that point which corresponds to the moisture it already contains. The latter is called *the point of saturation, or the dew point*.—Suppose, for example, that a cubic mass of air 40 inches every way at the temperature of  $17^{\circ}$  contains 200 grains of moisture; in order to render it absolutely damp, it would be necessary either to add 19.4 grains of humidity, or to reduce its temperature to  $15^{\circ}$ . The following then, are the problems that immediately present themselves to us, in this branch of meteorology; 1st, to ascertain the actual quantity of moisture in the air; 2d, the point of deposition or dew point; and 3d, the dryness of the air that is to say, the additional quantity of moisture that would be required to render it perfectly humid.

Various methods have been proposed for estimating the dryness, and of consequence the opposite humidity of the air. I shall only take notice of the two which are in most general use, viz. those of Daniel and of Leslie\*.—Mr. Daniel employs the evaporation of ether to produce a cold sufficient to cause the deposition of moisture from the air, and thus to detect the dew point. His hygrometer, or dew point instrument, constructed on this principle, acts tolerably well in the colder parts of Europe; but many serious objections apply to it, which render it totally useless in hot and dry climates. Under all circumstances it is difficult to ascertain the exact point of deposition; and even when this is done, with all the accuracy the instrument admits of, it will generally be found to be too high, owing to an original defect in its construction. In the hot climate of India, there is always a great waste of ether by evaporation, and it is impossible to procure it pure, unless from Europe. But the most serious objection remains to be stated: it frequently happens that the air is so excessively dry, that the very best ether is not capable of reducing the

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\* The different organic substances, such as hair, whale bone, ivory, &c. that have been used as hygrometers, being incapable of affording those exact indications, which the advanced state of the science now demands, have, I believe, been universally discarded, except by a few Meteorologists on the continent of Europe.

temperature sufficiently low to reach the dew point. This I have repeatedly found to be the case in Egypt, and the same thing has been remarked in India.

Sir John Leslie's method consists in determining the difference of temperature between a dry thermometer, and one having its ball moistened with pure water; and by means of the law of atmospheric solution discovered by him, and the formula he has founded thereupon, all the parts of the problem I have proposed above, may be easily and exactly determined.\* He has constructed a hygrometer upon this principle, by applying it to his differential thermometer; but this has nothing to recommend it, in preference to the arrangement of the two thermometers, which possess, the great advantages of being easily procurable, cheapness, and portability. By this method nothing more is required than two delicate thermometers, with centigrade or millesimal scales, and one of them having its ball covered with muslin or silk, which being wetted with distilled water, the depression below the other is noted. The form of the thermometer I have recommended for the æthrioscope and photometer, will be found most convenient for the hygrometer, for when placed upon a table, the covered ball, when once wetted, may be kept constantly moist by means of some loose cotton threads, passing over it from a small bottle filled with water.†

Leslie's table of the quantities of moisture in the state of vapour, contained in atmospheric air at different temperatures, is calculated for the centigrade scale. To render it more useful, I have interpolated it for every tenth part

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\* Vide Leslie on heat and moisture, and the article meteorology in the supplement to the *Encyclopædia Britannica*.

The accuracy of Leslie's formula has been called in question; and I have no doubt it requires revision. I feel confident, however, from some experiments I have made in reference to this subject, but which it would be out of place to detail here, that it affords results, which are seldom far from the truth, and are always capable of comparison. Moreover, the great facility of its application gives it a decided advantage over other methods that have been proposed.

I do not pretend to pronounce any opinion upon the theoretical views of Leslie regarding the nature of heat, or the manner in which water is maintained in the state of vapour in the air.

† All these thermometers might have the same screw under the ball so that in the event of one of them being broken, its place might be easily supplied. Thus a hygrometer might be converted into a photometer by removing the muslin or silk, and screwing on a small glass cover over its ball previously blackened, and vice versa.

of a centigrade degree, that is, for the degrees of the millimal scale. This table enables us, by a simple observation of the dry and wet bulb thermometers, to ascertain the dew point, the dryness, and the actual quantity of moisture in the air; and the mode of using it will be readily understood from the following examples. Suppose the wet bulb thermometer to mark 15.1, and the dry thermometer, at the same time, to stand at 19.0, the difference will be 3.9, which must be considered as a whole number. Look in the table for temperature 15.1, and opposite to it in the column of moisture will be found 200.9, from which subtract the above number 3.9, the remainder 161.9 is the exact quantity of moisture in grains in a cubic mass of air 40 inches every way. Look now in the column moisture for the nearest number to 161.9, and it will be found to be 161.7, and opposite to it is the temperature 10.4, which is the *dew point*. Now to find the dryness, search the table for temperature 19.0, and it will be seen to correspond to the number 240.6, in the adjoining column, from which subtract 161.9, and the remainder 78.7, will be the dryness, or the number of grains of moisture it would be necessary to add, to render the air perfectly damp. Let us take another example.

Dry thermometer. . . . . 24.0

Wet bulb thermometer. . . . 19.5    difference. . . . . 45.

19.5 in table. . . . . 246.9

Subtract. . . . . 45

201.9 *quantity of moisture*

201.9 in table. . . . . 15.2 *dew point*

24.0 in table. . . . . 303.1

Subtract. . . . . 201.9

101.2 *dryness.*

Since the condition of the air, in relation to moisture, must be always regulated, in a certain measure, by the temperature, it is not improbable that we may obtain an approximation to the average of the dew point, moisture, and dryness of the air for the whole 24 hours, by taking the mean of 10 A. M.

and 10 P. M. as in the case of the thermometer. Having found this opinion borne out by some experiments I made in Egypt, and at Madras I have adopted these two hours for the observations of the hygrometer, as well as of the other instruments ; and even should this method be found, hereafter, not to correspond with perfect accuracy to the true average, it will, at all events, in the mean time, ensure uniformity.

THE RAIN GAGE or OMBROMETER, for measuring the quantity of rain that falls on any spot, is a well known instrument in this country, and requires no description.

THE ATMOMETER, or EVAPOROMETER, is an instrument for measuring the quantity of water evaporated in any given time. Its most simple form is that of a round or square vessel of tin, of uniform dimensions, from top to bottom ; the depth of water, evaporated from which, may be easily measured. But a more convenient and more accurate instrument is the Atmometer of Leslie, which I shall describe in his own words. " This instrument is an useful auxiliary, and might with some attention, serve as a substitute for the hygrometer. It does not mark the dryness of the air, but it measures, (as its name denotes) the quantity of moisture exhaled from a humid surface in a given time. The Atmometer consists of a thin ball of porous earthenware, two or three inches in diameter, with a small neck, to which is firmly cemented a long and rather wide glass tube, bearing divisions each of them corresponding to an internal annular section, equal to a film of liquid, that would cover the outer surface of the ball to the thickness of the thousandth part of an inch. The divisions are ascertained by a simple calculation, and numbered downwards to the extent of 100 to 200 ; to the top of the tube is fitted a brass cap, having a collar of leather, and which, after the cavity has been filled with distilled water, is screwed tight. The outside of the ball being now wiped dry, the instrument is suspended out of doors, and exposed to the free access of the air. In this state of action the humidity transudes through the porous substance just as fast as it evaporates from the external surface, and this waste is measured by the corresponding descent of the water in the stem."

" The dissipation of moisture is much accelerated by the agency of sweeping winds, the effect being sometimes aug-

mented 5 or even 10 times.—In general this augmentation is proportional, as in the case of cooling, to the swiftness of the wind, the action of still air itself, being reckoned equal to that produced by a celerity of 8 miles each hour. Hence the velocity of winds is easily computed, from a comparison of the indications of a hygrometer with an atmometer, or of a sheltered, with those of an exposed, atmometer. Thus suppose the hygrometer to mark 40 degrees, or the column of water in a sheltered atmometer to subside at the rate of 2 divisions in an hour, while in one exposed to the current, the descent is 12 divisions; then as 2 is to 10, the superadded effect of the wind, so is 8 to 40 miles, the distance through which it has travelled in that time.

“The atmometer is an instrument evidently of extensive application, and of great utility in practice. To ascertain with accuracy and readiness the quantity of evaporation from any surface in a given time, is an important acquisition, not only in meteorology, but in agriculture and the various arts and manufactures.—The rate of exhalation from the surface of the ground is scarcely of less consequence than the fall of rain, and a knowledge of it might often direct the farmer advantageously in his operations.”

I may add, that from the experience I have had with this instrument,\* I am satisfied that it is liable to few or no objections; it affords most delicate and accurate information, is portable, and is not liable to derangement. It is only necessary to be very careful not to let the porous ball be soiled, which would be apt to clog up its pores. It ought therefore never to be touched even with the hand, and the instrument must therefore be lifted or carried by its glass tube. When not used it ought to be kept in a box, with its ball naked, for if wrapped in paper, part of the paper is apt to adhere to it.

Being acquainted with no method of ascertaining, with the slightest degree of accuracy, the electric condition of the atmosphere, I have not considered it necessary to leave any column for registering it in the meteorological table. The

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\* I carried one with me from England through the whole of Egypt, and a great part of the south of India, and it continues as perfect and acts as well as on the first day I used it.

occurrence of thunder or lightning may be noticed amongst the general remarks.

In constructing the accompanying form of a meteorological register, I had the valuable assistance of my friend Dr. Walker of the Bombay Medical Service.

All the instruments I have described may be procured from Mr. Robinson, Optician, 38, Devonshire Street, Portland Place; and I am happy to add that the Government of Fort St. George, have already recommended to the Court of Directors that from 20 to 30, complete sets should be furnished to this Presidency.

*Madras 4th September, 1832.*



TABLE 1.

*Correspondence of the Thermometers of Fahrenheit and the Centigrade.*

| <i>Fahr.</i> | <i>Centi.</i> | <i>Fahr.</i> | <i>Centi.</i> | <i>Fahr.</i> | <i>Centi.</i> |
|--------------|---------------|--------------|---------------|--------------|---------------|
| 212          | 100           | 171          | 77.2          | 130          | 54.4          |
| 211          | 99.4          | 170          | 76.6          | 129          | 53.8          |
| 210          | 98.8          | 169          | 76.1          | 128          | 53.2          |
| 209          | 98.3          | 168          | 75.5          | 127          | 52.7          |
| 208          | 97.7          | 167          | 75.           | 126          | 52.2          |
| 207          | 97.2          | 166          | 74.4          | 125          | 51.6          |
| 206          | 96.6          | 165          | 73.8          | 124          | 51.1          |
| 205          | 96.1          | 164          | 73.3          | 123          | 50.5          |
| 204          | 95.5          | 163          | 72.7          | 122          | 50.           |
| 203          | 95.           | 162          | 72.2          | 121          | 49.4          |
| 202          | 94.4          | 161          | 71.6          | 120          | 48.8          |
| 201          | 93.8          | 160          | 71.1          | 119          | 48.3          |
| 200          | 93.3          | 159          | 70.5          | 118          | 47.7          |
| 199          | 92.7          | 158          | 70.           | 117          | 47.2          |
| 198          | 92.2          | 157          | 69.4          | 116          | 46.6          |
| 197          | 91.6          | 156          | 68.8          | 115          | 46.1          |
| 196          | 91.1          | 155          | 68.3          | 114          | 45.5          |
| 195          | 90.5          | 154          | 67.7          | 113          | 45.           |
| 194          | 90.           | 153          | 67.2          | 112          | 44.4          |
| 193          | 89.4          | 152          | 66.6          | 111          | 43.8          |
| 192          | 88.8          | 151          | 66.1          | 110          | 43.3          |
| 191          | 88.3          | 150          | 65.5          | 109          | 42.7          |
| 190          | 87.7          | 149          | 65.           | 108          | 42.2          |
| 189          | 87.2          | 148          | 64.4          | 107          | 41.6          |
| 188          | 86.6          | 147          | 63.8          | 106          | 41.1          |
| 187          | 86.1          | 146          | 63.3          | 105          | 40.5          |
| 186          | 85.5          | 145          | 62.7          | 104          | 40.           |
| 185          | 85.           | 144          | 62.2          | 103          | 39.4          |
| 184          | 84.4          | 143          | 61.6          | 102          | 38.8          |
| 183          | 83.8          | 142          | 61.1          | 101          | 38.3          |
| 182          | 83.3          | 141          | 60.5          | 100          | 37.7          |
| 181          | 82.7          | 140          | 60.           | 99           | 37.2          |
| 180          | 82.2          | 139          | 59.4          | 98           | 36.6          |
| 179          | 81.6          | 138          | 58.8          | 97           | 36.1          |
| 178          | 81.1          | 137          | 58.3          | 96           | 35.5          |
| 177          | 80.5          | 136          | 57.7          | 95           | 35.           |
| 176          | 80.           | 135          | 57.2          | 94           | 34.4          |
| 175          | 79.4          | 134          | 56.6          | 93           | 33.8          |
| 174          | 78.8          | 133          | 56.1          | 92           | 33.3          |
| 173          | 78.3          | 132          | 55.5          | 91           | 32.7          |
| 172          | 77.7          | 131          | 55.           | 90           | 32.2          |

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| <i>Fahr.</i> | <i>Centi.</i> | <i>Fahr.</i> | <i>Centi.</i> | <i>Fahr.</i> | <i>Centi.</i> |
|--------------|---------------|--------------|---------------|--------------|---------------|
| 89           | 31.6          | 4            | 7.2           | 17           | 17.2          |
| 88           | 31.1          | 4            | 6.6           | 16           | 17.7          |
| 87           | 30.5          | 4            | 6.1           | 15           | 18.3          |
| 86           | 30.           | 4            | 5.5           | 14           | 18.8          |
| 85           | 29.4          | 4            | 5.            | 13           | 19.4          |
| 84           | 28.8          | 4            | 4.4           | 12           | 20.           |
| 83           | 28.3          | 3            | 3.8           | 11           | 20.5          |
| 82           | 27.7          | 3            | 3.3           | 10           | 21.1          |
| 81           | 27.2          | 3            | 2             | 9            | 21.6          |
| 80           | 26.6          | 3            | 2             | 8            | 22.2          |
| 79           | 26.1          | 3            | 1.            | 7            | 22.7          |
| 78           | 25.5          | 3            | 1.            | 6            | 23.3          |
| 77           | 25.           | 3            | 0.            | 5            | 23.8          |
| 76           | 24.4          | 3            | 0.            | 4            | 24.4          |
| 75           | 23.8          | 3            | 0.            | 3            | 25.           |
| 74           | 23.3          | 3            | 1.            | 2            | 25.5          |
| 73           | 22.7          | 2            | 1             | 1            | 26.1          |
| 72           | 22.2          | 2            | 2             | 0            | 26.6          |
| 71           | 21.6          | 2            | 2             | 31           | 27.2          |
| 70           | 21.1          | 2            | 3.            | 30           | 27.7          |
| 69           | 20.5          | 2            | 3.            | 29           | 28.3          |
| 68           | 20.           | 2            | 4.            | 28           | 28.8          |
| 67           | 19.4          | 2            | 5.            | 27           | 29.4          |
| 66           | 18.8          | 2            | 5.            | 26           | 30.           |
| 65           | 18.3          | 2            | 6.            | 25           | 30.5          |
| 64           | 17.7          | 2            |               | 24           | 31.1          |
| 63           | 17.2          | 2            |               | 23           | 31.6          |
| 62           | 16.6          | 2            | 7.7           | 22           | 32.           |
| 61           | 16.1          | 2            | 8.3           | 21           | 32.           |
| 60           | 15.5          | 2            | 8.9           | 20           | 33.3          |
| 59           | 15.           | 2            | 9.4           | 19           | 33.8          |
| 58           | 14.4          | 2            | 10            | 18           | 34.4          |
| 57           | 13.8          | 2            | 10.6          | 17           | 35.           |
| 56           | 13.3          | 2            | 11.1          | 16           | 35.5          |
| 55           | 12.7          | 2            | 11.6          | 15           | 36.1          |
| 54           | 12.2          | 2            | 12.2          | 14           | 36.6          |
| 53           | 11.6          | 2            | 12.7          | 13           | 37.2          |
| 52           | 11.1          | 2            | 13.3          | 12           | 37.7          |
| 51           | 10.5          | 2            | 13.8          | 11           | 38.3          |
| 50           | 10.           | 2            | 14.4          | 10           | 38.8          |
| 49           | 9.4           | 2            | 15.           | 9            | 39.4          |
| 48           | 8.8           | 2            | 15.5          | 8            | 40.           |
| 47           | 8.3           | 2            | 16.1          |              |               |
| 46           | 7.7           | 2            | 16.6          |              |               |

TABLE II.

*Corrections to be subtracted from the observed height of Genti. [meter to reduce it to the temperature of 32d Fahrenheit.*

| Therm | Inch.<br>23,00 | Inch.<br>24,00 | Inch.<br>25,00 | Inch.<br>26,00 | Inch.<br>27,00 | Inch.<br>28,00 | Inch.<br>29,00 | Inch.<br>30,00 | Inch.<br>31,00 |
|-------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 32    | 0,000          | 0,000          | 0,000          | 0,000          | 0,000          | 0,000          | 0,000          | 0,000          | 0,000          |
| 34    | ,004           | ,004           | ,004           | ,004           | ,004           | ,004           | ,005           | ,005           | ,005           |
| 36    | ,008           | ,008           | ,008           | ,009           | ,009           | ,009           | ,010           | ,010           | ,010           |
| 38    | ,012           | ,012           | ,013           | ,013           | ,014           | ,014           | ,015           | ,015           | ,015           |
| 40    | ,016           | ,016           | ,017           | ,018           | ,018           | ,019           | ,020           | ,020           | ,021           |
| 42    | 0,019          | 0,020          | 0,021          | 0,022          | 0,023          | 0,024          | 0,025          | 0,025          | 0,026          |
| 44    | ,023           | ,024           | ,025           | ,026           | ,027           | ,028           | ,030           | ,030           | ,031           |
| 46    | ,027           | ,028           | ,030           | ,031           | ,032           | ,033           | ,035           | ,035           | ,037           |
| 48    | ,031           | ,032           | ,034           | ,035           | ,036           | ,038           | ,040           | ,041           | ,042           |
| 50    | ,035           | ,037           | ,039           | ,040           | ,041           | ,043           | ,045           | ,046           | ,048           |
| 52    | 0,039          | 0,041          | 0,043          | 0,044          | 0,046          | 0,048          | 0,050          | 0,051          | 0,053          |
| 54    | ,043           | ,045           | ,047           | ,048           | ,050           | ,052           | ,055           | ,056           | ,058           |
| 56    | ,047           | ,049           | ,052           | ,053           | ,055           | ,057           | ,060           | ,061           | ,063           |
| 58    | ,051           | ,053           | ,056           | ,057           | ,059           | ,062           | ,065           | ,067           | ,068           |
| 60    | ,055           | ,057           | ,060           | ,062           | ,064           | ,067           | ,070           | ,072           | ,074           |
| 62    | 0,059          | 0,061          | 0,064          | 0,066          | 0,069          | 0,072          | 0,075          | 0,077          | 0,080          |
| 64    | ,063           | ,065           | ,068           | ,070           | ,073           | ,076           | ,079           | ,082           | ,085           |
| 66    | ,067           | ,069           | ,072           | ,075           | ,078           | ,081           | ,084           | ,087           | ,091           |
| 68    | ,071           | ,073           | ,077           | ,079           | ,082           | ,086           | ,089           | ,092           | ,096           |
| 70    | ,075           | ,078           | ,081           | ,084           | ,087           | ,091           | ,094           | ,098           | ,101           |
| 72    | 0,079          | 0,082          | 0,085          | 0,088          | 0,092          | 0,096          | 0,099          | 0,103          | 0,106          |
| 74    | ,083           | ,086           | ,089           | ,092           | ,096           | ,100           | ,104           | ,108           | ,111           |
| 76    | ,087           | ,090           | ,094           | ,097           | ,101           | ,105           | ,109           | ,113           | ,117           |
| 78    | ,091           | ,094           | ,098           | ,102           | ,105           | ,110           | ,114           | ,118           | ,122           |
| 80    | ,095           | ,099           | ,102           | ,106           | ,110           | ,115           | ,119           | ,123           | ,128           |
| 82    | 0,099          | 0,103          | 0,107          | 0,111          | 0,115          | 0,120          | 0,124          | 0,128          | 0,133          |
| 84    | ,103           | ,107           | ,111           | ,115           | ,119           | ,124           | ,129           | ,133           | ,138           |
| 86    | ,107           | ,111           | ,116           | ,120           | ,124           | ,129           | ,134           | ,139           | ,144           |
| 88    | ,111           | ,115           | ,120           | ,124           | ,128           | ,133           | ,139           | ,144           | ,149           |
| 90    | ,115           | ,120           | ,124           | ,129           | ,133           | ,138           | ,144           | ,150           | ,154           |

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| <i>Therm</i> | <i>Inch.</i> | <i>Inch.</i> | <i>Inch.</i> | <i>Inch.</i> | <i>Inch.</i> | <i>Inch.</i> | <i>Inch.</i> | <i>Inch.</i> | <i>Inch.</i> |
|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 23.00        | 24.00        | 25.00        | 26.00        | 27.00        | 28.00        | 29.00        | 30.00        | 31.00        |              |
| 92           | 0,119        | 0,124        | 0,129        | 0,134        | 0,138        | 0,143        | 0,149        | 0,155        | 0,160        |
| 94           | ,123         | ,128         | ,133         | ,138         | ,142         | ,147         | ,153         | ,159         | ,165         |
| 96           | ,127         | ,132         | ,137         | ,142         | ,147         | ,152         | ,158         | ,164         | ,170         |
| 98           | ,130         | ,136         | ,141         | ,146         | ,151         | ,156         | ,163         | ,169         | ,176         |
| 100          | ,134         | ,140         | ,146         | ,151         | ,157         | ,161         | ,168         | ,174         | ,181         |
| 102          | 0,138        | 0,144        | 0,150        | 0,155        | 0,161        | 0,166        | 0,173        | 0,179        | 0,186        |
| 104          | ,142         | ,148         | ,154         | ,159         | ,165         | ,171         | ,178         | ,184         | ,191         |
| 106          | ,146         | ,152         | ,159         | ,164         | ,170         | ,176         | ,183         | ,190         | ,197         |
| 108          | ,150         | ,157         | ,163         | ,169         | ,175         | ,181         | ,189         | ,195         | ,202         |
| 110          | ,154         | ,161         | ,168         | ,174         | ,180         | ,187         | ,194         | ,201         | ,207         |
| 112          | 0,158        | 0,166        | 0,172        | 0,178        | 0,185        | 0,192        | 0,199        | 0,206        | 0,213        |

TABLE III.

*Shewing the weight of moisture held in the State of vapour in atmospheric air at different temperatures by the 'Müllers's' Scale.*

| Temperature | Moisture | Temperature | Moisture | Temperature | Moisture |
|-------------|----------|-------------|----------|-------------|----------|
| — 15.0      | 50.0     | — 11.0      | 60.1     | — 7.0       | 72.4     |
| — 14.9      | 50.2     | — 10.9      | 60.4     | — 6.9       | 72.7     |
| — 14.8      | 50.5     | — 10.8      | 60.7     | — 6.8       | 73.1     |
| — 14.7      | 50.7     | — 10.7      | 61.0     | — 6.7       | 73.4     |
| — 14.6      | 51.0     | — 10.6      | 61.3     | — 6.6       | 73.8     |
| — 14.5      | 51.2     | — 10.5      | 61.5     | — 6.5       | 74.1     |
| — 14.4      | 51.4     | — 10.4      | 61.8     | — 6.4       | 74.4     |
| — 14.3      | 51.7     | — 10.3      | 62.1     | — 6.3       | 74.8     |
| — 14.2      | 51.9     | — 10.2      | 62.4     | — 6.2       | 75.1     |
| — 14.1      | 52.2     | — 10.1      | 62.7     | — 6.1       | 75.5     |
| — 14.0      | 52.4     | — 10.0      | 63.0     | — 6.0       | 75.8     |
| — 13.9      | 52.6     | — 9.9       | 63.3     | — 5.9       | 76.2     |
| — 13.8      | 52.9     | — 9.8       | 63.6     | — 5.8       | 76.5     |
| — 13.7      | 53.1     | — 9.7       | 63.9     | — 5.7       | 76.9     |
| — 13.6      | 53.4     | — 9.6       | 64.2     | — 5.6       | 77.2     |
| — 13.5      | 53.6     | — 9.5       | 64.5     | — 5.5       | 77.6     |
| — 13.4      | 53.9     | — 9.4       | 64.8     | — 5.4       | 78.0     |
| — 13.3      | 54.1     | — 9.3       | 65.1     | — 5.3       | 78.3     |
| — 13.2      | 54.4     | — 9.2       | 65.4     | — 5.2       | 78.7     |
| — 13.1      | 54.6     | — 9.1       | 65.7     | — 5.1       | 79.0     |
| — 13.0      | 54.9     | — 9.0       | 66.0     | — 5.0       | 79.4     |
| — 12.9      | 55.1     | — 8.9       | 66.3     | — 4.9       | 79.8     |
| — 12.8      | 55.4     | — 8.8       | 66.6     | — 4.8       | 80.1     |
| — 12.7      | 55.6     | — 8.7       | 66.9     | — 4.7       | 80.5     |
| — 12.6      | 55.9     | — 8.6       | 67.2     | — 4.6       | 80.9     |
| — 12.5      | 56.1     | — 8.5       | 67.5     | — 4.5       | 81.2     |
| — 12.4      | 56.4     | — 8.4       | 67.9     | — 4.4       | 81.6     |
| — 12.3      | 56.6     | — 8.3       | 68.2     | — 4.3       | 82.0     |
| — 12.2      | 56.9     | — 8.2       | 68.5     | — 4.2       | 82.4     |
| — 12.1      | 57.1     | — 8.1       | 68.8     | — 4.1       | 82.7     |
| — 12.0      | 57.4     | — 8.0       | 69.1     | — 4.0       | 83.1     |
| — 11.9      | 57.7     | — 7.9       | 69.4     | — 3.9       | 83.5     |
| — 11.8      | 57.9     | — 7.8       | 69.8     | — 3.8       | 83.9     |
| — 11.7      | 58.2     | — 7.7       | 70.1     | — 3.7       | 84.3     |
| — 11.6      | 58.5     | — 7.6       | 70.4     | — 3.6       | 84.7     |
| — 11.5      | 58.7     | — 7.5       | 70.7     | — 3.5       | 85.1     |
| — 11.4      | 59.0     | — 7.4       | 71.1     | — 3.4       | 85.5     |
| — 11.3      | 59.3     | — 7.3       | 71.4     | — 3.3       | 85.9     |
| — 11.2      | 59.6     | — 7.2       | 71.7     | — 3.2       | 86.3     |
| — 11.1      | 59.8     | — 7.1       | 72.1     | — 3.1       | 86.7     |

| <i>Tempe-<br/>rature</i> | <i>Moisture</i> | <i>Tempe-<br/>rature</i> | <i>Moisture</i> | <i>Tempe-<br/>rature</i> | <i>Moisture</i> |
|--------------------------|-----------------|--------------------------|-----------------|--------------------------|-----------------|
| — 3.0                    | 87.1            | 1.5                      | 107.2           | 6.0                      | 132.0           |
| — 2.9                    | 87.5            | 1.6                      | 107.7           | 6.1                      | 132.6           |
| — 2.8                    | 87.9            | 1.7                      | 108.2           | 6.2                      | 133.2           |
| — 2.7                    | 88.3            | 1.8                      | 108.7           | 6.3                      | 133.8           |
| — 2.6                    | 88.9            | 1.9                      | 109.2           | 6.4                      | 134.5           |
| — 2.5                    | 89.1            | 2.0                      | 109.7           | 6.5                      | 135.0           |
| — 2.4                    | 89.6            | 2.1                      | 110.2           | 6.6                      | 135.6           |
| — 2.3                    | 90.0            | 2.2                      | 110.7           | 6.7                      | 136.2           |
| — 2.2                    | 90.4            | 2.3                      | 111.3           | 6.8                      | 136.8           |
| — 2.1                    | 90.8            | 2.4                      | 111.8           | 6.9                      | 137.6           |
| — 2.0                    | 91.2            | 2.5                      | 112.3           | 7.0                      | 138.2           |
| — 1.9                    | 91.6            | 2.6                      | 112.8           | 7.1                      | 138.8           |
| — 1.8                    | 92.1            | 2.7                      | 113.3           | 7.2                      | 139.5           |
| — 1.7                    | 92.5            | 2.8                      | 113.9           | 7.3                      | 140.1           |
| — 1.6                    | 92.9            | 2.9                      | 114.3           | 7.4                      | 140.8           |
| — 1.5                    | 93.3            | 3.0                      | 114.9           | 7.5                      | 141.4           |
| — 1.4                    | 93.8            | 3.1                      | 115.4           | 7.6                      | 142.1           |
| — 1.3                    | 94.2            | 3.2                      | 116.0           | 7.7                      | 142.7           |
| — 1.2                    | 94.6            | 3.3                      | 116.5           | 7.8                      | 143.4           |
| — 1.1                    | 95.1            | 3.4                      | 117.1           | 7.9                      | 144.1           |
| — 1.0                    | 95.5            | 3.5                      | 117.6           | 8.0                      | 144.7           |
| — 0.9                    | 95.9            | 3.6                      | 118.1           | 8.1                      | 145.4           |
| — 0.8                    | 96.4            | 3.7                      | 118.7           | 8.2                      | 146.0           |
| — 0.7                    | 96.8            | 3.8                      | 119.2           | 8.3                      | 146.8           |
| — 0.6                    | 97.2            | 3.9                      | 119.8           | 8.4                      | 147.4           |
| — 0.5                    | 97.7            | 4.0                      | 120.3           | 8.5                      | 148.1           |
| — 0.4                    | 98.2            | 4.1                      | 120.8           | 8.6                      | 148.8           |
| — 0.3                    | 98.6            | 4.2                      | 121.4           | 8.7                      | 149.5           |
| — 0.2                    | 99.1            | 4.3                      | 122.0           | 8.8                      | 150.2           |
| — 0.1                    | 99.5            | 4.4                      | 122.5           | 8.9                      | 150.9           |
| — 0.0                    | 100.0           | 4.5                      | 123.1           | 9.0                      | 151.6           |
| — 0.1                    | 100.5           | 4.6                      | 123.7           | 9.1                      | 152.3           |
| — 0.2                    | 100.9           | 4.7                      | 124.3           | 9.2                      | 153.0           |
| — 0.3                    | 101.3           | 4.8                      | 124.9           | 9.3                      | 153.7           |
| — 0.4                    | 101.9           | 4.9                      | 125.4           | 9.4                      | 154.4           |
| — 0.5                    | 102.3           | 5.0                      | 126.0           | 9.5                      | 155.1           |
| — 0.6                    | 102.7           | 5.1                      | 126.6           | 9.6                      | 155.8           |
| — 0.7                    | 103.3           | 5.2                      | 127.2           | 9.7                      | 156.5           |
| — 0.8                    | 103.8           | 5.3                      | 127.8           | 9.8                      | 157.2           |
| — 0.9                    | 104.2           | 5.4                      | 128.4           | 9.9                      | 158.0           |
| — 1.0                    | 104.7           | 5.5                      | 129.0           | 10.0                     | 158.7           |
| — 1.1                    | 105.2           | 5.6                      | 129.6           | 10.1                     | 159.4           |
| — 1.2                    | 105.7           | 5.7                      | 130.2           | 10.2                     | 160.2           |
| — 1.3                    | 106.2           | 5.8                      | 130.8           | 10.3                     | 160.9           |
| — 1.4                    | 106.7           | 5.9                      | 131.4           | 10.4                     | 161.7           |

| Tempe-<br>rature | Moisture | Tempe-<br>rature | Moisture | Tempe-<br>rature | Moisture |
|------------------|----------|------------------|----------|------------------|----------|
| 10.5             | 162.4    | 15.0             | 200.0    | 19.5             | 246.9    |
| 10.6             | 163.2    | 15.1             | 200.9    | 19.6             | 247.4    |
| 10.7             | 164.0    | 15.2             | 201.9    | 19.7             | 248.6    |
| 10.8             | 164.7    | 15.3             | 202.8    | 19.8             | 249.7    |
| 10.9             | 165.4    | 15.4             | 203.9    | 19.9             | 250.8    |
| 11.0             | 166.2    | 15.5             | 204.7    | 20.0             | 252.0    |
| 11.1             | 167.0    | 15.6             | 205.8    | 20.1             | 253.2    |
| 11.2             | 167.6    | 15.7             | 206.6    | 20.2             | 254.3    |
| 11.3             | 168.5    | 15.8             | 207.6    | 20.3             | 255.5    |
| 11.4             | 169.3    | 15.9             | 208.6    | 20.4             | 256.7    |
| 11.5             | 170.1    | 16.0             | 209.5    | 20.5             | 257.9    |
| 11.6             | 170.9    | 16.1             | 210.4    | 20.6             | 259.1    |
| 11.7             | 171.7    | 16.2             | 211.5    | 20.7             | 260.3    |
| 11.8             | 172.5    | 16.3             | 212.5    | 20.8             | 261.5    |
| 11.9             | 173.0    | 16.4             | 213.5    | 20.9             | 262.7    |
| 12.0             | 174.1    | 16.5             | 214.4    | 21.0             | 263.9    |
| 12.1             | 174.8    | 16.6             | 215.4    | 21.1             | 265.1    |
| 12.2             | 175.6    | 16.7             | 216.4    | 21.2             | 266.4    |
| 12.3             | 176.5    | 16.8             | 217.4    | 21.3             | 267.6    |
| 12.4             | 177.3    | 16.9             | 218.4    | 21.4             | 269.0    |
| 12.5             | 178.1    | 17.0             | 219.4    | 21.5             | 270.1    |
| 12.6             | 178.9    | 17.1             | 220.4    | 21.6             | 271.4    |
| 12.7             | 179.8    | 17.2             | 221.4    | 21.7             | 272.6    |
| 12.8             | 180.6    | 17.3             | 222.4    | 21.8             | 273.9    |
| 12.9             | 181.5    | 17.4             | 223.5    | 21.9             | 275.1    |
| 13.0             | 182.3    | 17.5             | 224.5    | 22.0             | 276.4    |
| 13.1             | 183.1    | 17.6             | 225.6    | 22.1             | 277.7    |
| 13.2             | 184.0    | 17.7             | 226.6    | 22.2             | 279.0    |
| 13.3             | 184.9    | 17.8             | 227.6    | 22.3             | 280.3    |
| 13.4             | 185.8    | 17.9             | 228.7    | 22.4             | 281.6    |
| 13.5             | 186.6    | 18.0             | 229.7    | 22.5             | 282.9    |
| 13.6             | 187.5    | 18.1             | 230.8    | 22.6             | 284.2    |
| 13.7             | 188.4    | 18.2             | 231.9    | 22.7             | 285.6    |
| 13.8             | 189.3    | 18.3             | 232.9    | 22.8             | 286.8    |
| 13.9             | 190.1    | 18.4             | 234.0    | 22.9             | 288.2    |
| 14.0             | 191.0    | 18.5             | 235.1    | 23.0             | 289.5    |
| 14.1             | 191.9    | 18.6             | 236.2    | 23.1             | 290.8    |
| 14.2             | 192.8    | 18.7             | 237.3    | 23.2             | 292.2    |
| 14.3             | 193.7    | 18.8             | 238.4    | 23.3             | 293.5    |
| 14.4             | 194.6    | 18.9             | 239.5    | 23.4             | 294.9    |
| 14.5             | 195.5    | 19.0             | 240.6    | 23.5             | 296.3    |
| 14.6             | 196.4    | 19.1             | 241.7    | 23.6             | 297.6    |
| 14.7             | 197.3    | 19.2             | 242.9    | 23.7             | 299.0    |
| 14.8             | 198.2    | 19.3             | 244.0    | 23.8             | 300.4    |
| 14.9             | 199.1    | 19.4             | 245.1    | 23.9             | 301.7    |

| Temperature | Moisture | Temperature | Moisture | Temperature | Moisture |
|-------------|----------|-------------|----------|-------------|----------|
| 21.0        | 303.1    | 28.5        | 373.3    | 33.0        | 459.5    |
| 21.1        | 304.5    | 28.6        | 375.0    | 33.1        | 461.7    |
| 21.2        | 306.0    | 28.7        | 376.7    | 33.2        | 463.8    |
| 21.3        | 307.4    | 28.8        | 378.4    | 33.3        | 466.0    |
| 21.4        | 308.8    | 28.9        | 380.2    | 33.4        | 468.2    |
| 21.5        | 310.3    | 29.0        | 381.9    | 33.5        | 470.5    |
| 21.6        | 311.7    | 29.1        | 383.7    | 33.6        | 472.7    |
| 21.7        | 313.3    | 29.2        | 385.5    | 33.7        | 474.7    |
| 21.8        | 314.6    | 29.3        | 387.3    | 33.8        | 476.9    |
| 21.9        | 316.1    | 29.4        | 389.1    | 33.9        | 479.0    |
| 22.0        | 317.5    | 29.5        | 390.9    | 34.0        | 481.2    |
| 22.1        | 319.0    | 29.6        | 392.7    | 34.1        | 483.5    |
| 22.2        | 320.5    | 29.7        | 394.6    | 34.2        | 485.8    |
| 22.3        | 322.0    | 29.8        | 396.4    | 34.3        | 488.0    |
| 22.4        | 323.5    | 29.9        | 398.2    | 34.4        | 490.3    |
| 22.5        | 325.0    | 30.0        | 400.0    | 34.5        | 492.6    |
| 22.6        | 326.5    | 30.1        | 401.9    | 34.6        | 494.9    |
| 22.7        | 328.5    | 30.2        | 403.7    | 34.7        | 497.1    |
| 22.8        | 329.0    | 30.3        | 405.7    | 34.8        | 499.4    |
| 22.9        | 330.5    | 30.4        | 406.7    | 34.9        | 501.7    |
| 23.0        | 332.5    | 30.5        | 409.4    | 35.0        | 504.0    |
| 23.1        | 334.0    | 30.6        | 411.3    | 35.1        | 506.4    |
| 23.2        | 335.6    | 30.7        | 413.2    | 35.2        | 508.7    |
| 23.3        | 337.2    | 30.8        | 415.1    | 35.3        | 511.1    |
| 23.4        | 338.7    | 30.9        | 417.0    | 35.4        | 513.5    |
| 23.5        | 340.3    | 31.0        | 418.9    | 35.5        | 515.9    |
| 23.6        | 341.9    | 31.1        | 420.8    | 35.6        | 518.3    |
| 23.7        | 343.5    | 31.2        | 422.7    | 35.7        | 520.6    |
| 23.8        | 345.0    | 31.3        | 424.8    | 35.8        | 523.0    |
| 23.9        | 346.6    | 31.4        | 426.8    | 35.9        | 525.4    |
| 24.0        | 348.2    | 31.5        | 428.8    | 36.0        | 527.8    |
| 24.1        | 349.8    | 31.6        | 430.8    | 36.1        | 530.3    |
| 24.2        | 351.5    | 31.7        | 432.8    | 36.2        | 532.8    |
| 24.3        | 353.1    | 31.8        | 434.7    | 36.3        | 535.3    |
| 24.4        | 354.8    | 31.9        | 436.7    | 36.4        | 537.8    |
| 24.5        | 356.1    | 32.0        | 438.7    | 36.5        | 540.3    |
| 24.6        | 358.1    | 32.1        | 440.8    | 36.6        | 542.8    |
| 24.7        | 359.7    | 32.2        | 442.9    | 36.7        | 545.3    |
| 24.8        | 361.4    | 32.3        | 444.9    | 36.8        | 547.8    |
| 24.9        | 363.0    | 32.4        | 447.0    | 36.9        | 550.3    |
| 25.0        | 364.7    | 32.5        | 449.1    | 37.0        | 552.8    |
| 25.1        | 366.4    | 32.6        | 451.2    | 37.1        | 555.4    |
| 25.2        | 368.1    | 32.7        | 453.3    | 37.2        | 558.0    |
| 25.3        | 369.8    | 32.8        | 455.3    | 37.3        | 560.6    |
| 25.4        | 371.6    | 32.9        | 457.4    | 37.4        | 563.2    |



| <i>Tempe-<br/>rature</i> | <i>Moisture</i> | <i>Tempe-<br/>rature</i> | <i>Moisture</i> | <i>Tempe-<br/>rature</i> | <i>Moisture</i> |
|--------------------------|-----------------|--------------------------|-----------------|--------------------------|-----------------|
| 37.5                     | 565.8           | 39.7                     | 626.4           | 41.9                     | 693.3           |
| 37.6                     | 568.5           | 39.8                     | 629.2           | 42.0                     | 696.4           |
| 37.7                     | 571.1           | 39.9                     | 632.1           | 42.1                     | 699.7           |
| 37.8                     | 573.7           | 40.0                     | 635.0           | 42.2                     | 703.0           |
| 37.9                     | 576.3           | 40.1                     | 638.0           | 42.3                     | 706.3           |
| 38.0                     | 578.9           | 40.2                     | 641.0           | 42.4                     | 709.6           |
| 38.1                     | 581.6           | 40.3                     | 644.0           | 42.5                     | 712.9           |
| 38.2                     | 584.4           | 40.4                     | 647.0           | 42.6                     | 716.2           |
| 38.3                     | 587.1           | 40.5                     | 650.0           | 42.7                     | 719.5           |
| 38.4                     | 589.9           | 40.6                     | 653.0           | 42.8                     | 722.8           |
| 38.5                     | 592.6           | 40.7                     | 656.0           | 42.9                     | 726.1           |
| 38.6                     | 595.3           | 40.8                     | 659.0           | 43.0                     | 729.4           |
| 38.7                     | 598.1           | 40.9                     | 662.0           | 43.1                     | 732.8           |
| 38.8                     | 600.8           | 41.0                     | 665.0           | 43.2                     | 736.3           |
| 38.9                     | 603.6           | 41.1                     | 668.1           | 43.3                     | 739.7           |
| 39.0                     | 606.3           | 41.2                     | 671.3           | 43.4                     | 743.2           |
| 39.1                     | 609.2           | 41.3                     | 674.4           | 43.5                     | 746.6           |
| 39.2                     | 612.0           | 41.4                     | 677.5           | 43.6                     | 750.1           |
| 39.3                     | 614.9           | 41.5                     | 680.7           | 43.7                     | 753.5           |
| 39.4                     | 617.8           | 41.6                     | 683.8           | 43.8                     | 757.0           |
| 39.5                     | 620.6           | 41.7                     | 687.0           | 43.9                     | 760.4           |
| 39.6                     | 623.3           | 41.8                     | 690.1           | 44.0                     | 763.9           |

Moisture.

Rain.

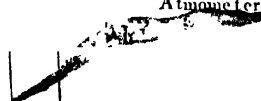
Evaporation

10 A. M.

10 P. M.

Mean.

Atmometer



| Hygrom | Differ. | Quant | Dry | Dew | Hygrom | Differ. | Quant | Dry | Dew | Hygrom | Differ. | Quant | Dry | Dew | Hygrom | Differ. | Quant | Dry | Dew |
|--------|---------|-------|-----|-----|--------|---------|-------|-----|-----|--------|---------|-------|-----|-----|--------|---------|-------|-----|-----|
|        |         |       |     |     |        |         |       |     |     |        |         |       |     |     |        |         |       |     |     |

Night Day. Total 10 P. M. 10 A. M. to 10 A. M.



|      |                            |
|------|----------------------------|
| Day. | <i>Daily Observations.</i> |
|------|----------------------------|

|   |          |
|---|----------|
| 5 | <i>5</i> |
|---|----------|

|   |          |
|---|----------|
| 5 | <i>5</i> |
|---|----------|

|   |          |
|---|----------|
| 6 | <i>6</i> |
|---|----------|

|   |          |
|---|----------|
| 7 | <i>7</i> |
|---|----------|

|   |          |
|---|----------|
| 8 | <i>8</i> |
|---|----------|

|   |          |
|---|----------|
| 9 | <i>9</i> |
|---|----------|

|    |           |
|----|-----------|
| 10 | <i>10</i> |
|----|-----------|

|    |           |
|----|-----------|
| 11 | <i>11</i> |
|----|-----------|

|    |           |
|----|-----------|
| 12 | <i>12</i> |
|----|-----------|

|    |           |
|----|-----------|
| 13 | <i>13</i> |
|----|-----------|

|    |           |
|----|-----------|
| 14 | <i>14</i> |
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|    |           |
|----|-----------|
| 15 | <i>15</i> |
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|    |           |
|----|-----------|
| 17 | <i>17</i> |
|----|-----------|

|    |           |
|----|-----------|
| 20 | <i>20</i> |
|----|-----------|

|    |           |
|----|-----------|
| 26 | <i>26</i> |
|----|-----------|

|    |           |
|----|-----------|
| 27 | <i>27</i> |
|----|-----------|

|    |           |
|----|-----------|
| 28 | <i>28</i> |
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*Monthly Observations*

1835.

*Meteorological Observations.*

67

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*To the Editor of the Madras  
Literary and Scientific Journal.*

SIR,

I send you along with this, some observations on a plant, which has of late years justly claimed for itself, a considerable share of attention among the medical profession.—If such communications are in accordance with the plan of the Madras Journal, I trust you will give it a place in an early number, as I am anxious to make known to the medical establishment, the important discovery that the true Mudar is a native of the Peninsula; in the hope that some of those favourably situated for such enquiries, may put its qualities to the test of experience, and favour their brethren who take an interest in it, with the result.

To the observations on Mudar, I have added a few others on several species of the family of Asclepiadæ; showing that we have still much to learn respecting the properties of this curious family of plants, and that we may expect from it, when better known, some very valuable additions to the Materia Medica; and I may here add, to the commercial resources of India. Some information of the latter description we already possess, in the works of that indefatigable naturalist Dr. Roxburgh, but we have still much to learn; which is only to be obtained from the united efforts of many, as no man, however diligent, can accomplish every thing, particularly at a time like the present, when even to keep pace with the stream of discovery, requires application of no ordinary kind. It has been my wish in that part of my essay, to endeavour to direct that stream into new channels, by collecting what is known into one view, and requesting others to come forward with their discoveries and observations on a subject so deeply interesting to us all, as the alleviation of human suffering.

I take this opportunity of mentioning, that the present essay may be viewed as an imperfect specimen, of a larger work, which I have long contemplated, and for which I am now collecting materials, as rapidly as my other avocations will permit,—An Indian medical Botany.

The plan and object of this work is to give figures and descriptions of Indian medical, and otherwise useful plants,

grouped according to their natural affinities ; embracing under each order, a succinct account of the properties for which it is remarkable, and under each species those which have been ascribed as belonging to it individually ; thus teaching, if I may so express myself, both the theory and practice of medical Botany, by reducing to a systematic arrangement, the numerous detached facts which during a long series of years have been accumulating ; many of which are now nearly lost, from the multiplicity of works through which they are scattered. I am well aware that to complete such a work, requires leisure, and opportunities of consulting rare and costly volumes, that do not fall to my lot ; but to form the ground work by reducing to system all that is easily accessible, is to lay the foundation of an edifice which others can easily complete.

Trusting that the example of Dr. Wallich of Calcutta, and of Mr. Malcolmson, both of whom have liberally offered their assistance, will be followed by my medical brethren generally, I shall cheerfully continue the labours I have commenced, in the hope of seeing them at no very distant period, crowned with success.

I remain, Sir,  
yours &c.

ROB. WIGHT.

Bellary, 15th Nov. 1834.

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III.—Observations | Mudar (*Calotropis procera*), with  
some remarks on the medicinal properties of the natural order  
*Asclepiadaceæ*. By ROB. WIGHT M. D. Surgeon 33d Regt.  
N. I.

The attention of the profession was directed some years ago to the medical properties of the mudar plant, by several papers on the subject published in Bengal, and in part republished in the medical periodicals of Europe. The writers of these papers, gave such favorable accounts of its virtues in the cure of disease, that many others were induced to try it, both in this country and in Europe. The trials made in the Carnatic, with the Mudar of the country, did not tend to confirm the favourable accounts given of it by the Bengal medical officers, nor did the effects produced, correspond with their accounts, or with those published in

Europe by medical men who had employed it there, from specimens of the medicine sent from Bengal. These very unexpected results, gave rise to a suspicion that the Bengal and Carnatic plants were different species. It was afterwards proved to be the case; first, I believe, by the late Dr. Buchanan Hamilton, who called the one *Calotropis (asclepias) gigantea*, the other *procera*—(the true Mudar of Bengal). It now only remained to determine, whether the *C. procera* was a native of the peninsula, and if so, the marks by which it might be distinguished from the other, which it so much resembles in general appearance, as to have been long confounded with it.—It is the object of this communication to determine these points.

The *Calotropis procera* abounds in the ceded districts to the almost entire exclusion of the *gigantea*, and is found here in all soils, while the other is equally abundant on the coast. It is not improbable I think, that the *procera* will be found in every district where Trap formations are indicated by the presence of black cotton soil, and that it will be found in such situations in the Carnatic if not prevented by an unfavourable climate. This point however can only be determined by future observations, which will require to be made with some care, as the two plants are so much alike in their general aspect, that they cannot with certainty be distinguished unless in flower; and then they can be distinguished at a glance, even before the flowers are full blown.

Previous to detailing the characters of the genus and of these two species, it appears advisable to give some account of the natural order to which they belong.

The *Asclepiadeæ* rank in the Linnean Natural Order *Contortæ*, and in Jussieu's eleventh class, characterised by having a monopetalous inferior corolla with distinct anthers. In the sexual system they were arranged by Linnæus in the class *Pentandria*, order *Digynia*, an arrangement that has been followed by most authors, though objected to by some, who thought that they would be better placed in *Monadelphia* or *Gynandria*. The characters of this order first established by Mr. Brown, are: Calyx 5 cleft, corolla of one petal, variously cleft. Stamens 5, filaments usually flat,



surrounding the styles and ovaries. Anthers often ending in a membranous point, resting on the stigma, each edge extended into a projecting angle or wing, (very conspicuous in *calotropis*), furnished within, with two pollen cells, opening laterally. Pollen, with a few exceptions, composed of 10 waxy looking masses, which when arrived at maturity are attached either by the base or apex, (pendulous or erect) in pairs, to 5 small, dark shining glands, placed on the angles of the stigma, opposite to as many furrows (*sulci*) between the wings of the anthers, (these furrows perform an important function in the impregnation of the *asclepiadeæ*). Ovaries two, superior, one celled, with numerous ovules, styles united at the apex, into a single large stigma. Stigma usually flattened or slightly convex, rarely terminating in a lengthened beak. Fruit a follicle, or one celled capsule opening on one side only. Seeds numerous, imbricated, compressed, often bound by a membranous margin, and with one or two exceptions, furnished with a tuft of down at the apex. *Plants milky, herbacious or shrubby, twining or erect, leaves opposite, entire; peduncles lateral (from between the insertions of the leaves), flowers usually umbelled.*

In addition to these more constant characters, the staminal column is often furnished with 5 variously shaped leaves, *Nectaries* Lin.—*Staminal crown* Brown. They are sometimes wanting on the stamens, and are then generally found on the corolla, terminating with its lobes. When present on the stamens, they are attached to the filaments. They vary much in their form and mode of attachment in different genera, and afford good generic characters when taken in connexion with the erect transverse or pendulous position of the pollen masses, and often the best specific distinctions.

Such are the usual characters of the true *asclepiadeæ*. They differ from the *Apocynæ*, with which Jussieu united them, principally in the form and structure of their stamens and pollen, but approach them by a sub-order *Periploceæ* Brown, in which the pollen is granular, enclosed in 5 membranous sacks opening outwards, and not attached to the stigma by glands.

The genus *Calotropis* (Brown) ranges in the section with pendulous pollen masses, and is readily known by having its coronal leaves revolute at the base, adhering by the edge their whole length to the filaments, and by short thick inflated smooth follicles. The plants shrubby, very rarely herbarious, erect, clothed with white pubescent down.

*C. gigantea*. Corolla deeply 5 cleft, segments reflexed, revolute on the margin; crown leaves shorter than the staminal column, flattened and obtusely 3 lobed at the apex; flower bud before expansion, ovate, obtuse.

*C. procera*. Corolla somewhat bell shaped, 5 cleft, segments pointed, crown leaves equaling the staminal column, truncated at the apex; flower bud before expansion globular.

The corolla in this species does not become reflexed, nor the segments revolute on the margin as in the former.

These characters will always, I believe, distinguish the plants separately; when seen together, they cannot be mistaken. The much larger, pale coloured, reflexed corolla of the former, with its coronal leaflets shorter than the column, broader in the middle and gradually narrowing towards the flattened apex when compared with the smaller, bright coloured, bell shaped corolla of the latter, with its coronal leaflets nearly the same breadth throughout and appearing as if cut off square with the apex of the stigma, marks at once the difference. When the flowers are in bud only, the lengthened form of the buds of the former, compared with the globose form of the latter, is equally characteristic. In addition to these more certain marks, the leaves of the latter are broader at the base, having more the true heart shape than the former, in which they sometimes even approach to cuneate, but this is a very uncertain mark.

In the above descriptions, I have not adopted the condensed style of botanical writings, from a desire to present the subject in a form so familiar as to be readily understood by those who have not made Botany their study, and the accompanying figures will I trust render any further description of the plants unnecessary.

The medical virtues assigned to these plants are very various, and the benefits said to be derived from their use more numerous, than, I fear, we will find it easy to substantiate

Roxburgh says, in his *Flora Indica*, “ the natives apply the milky juice to various medical purposes, besides which, they employ the plant itself, and the preparations thereof, to cure ~~an~~ of fits; epilepsy, hysterics, convulsions, spasmodic disorders, such as locked jaw, convulsions in children, paralytic complaints cold sweats, poisonous bites, and venereal complaints.” Dr. Ainslie says of his *Vullerkoo* (pale *asclepias gigantea*), “ the bark is warmish, and when powdered and mixed with a certain portion of margosa oil, is used as an external application in rheumatic affections; that the milky juice is considered alterative and aperient. Of his *Yercum vayer* (the root of the darker coloured kind) that, this pale coloured bark is bitter and somewhat warm to the taste; a decoction of it is given occasionally as a gentle stimulant in fevers, and in dyspeptic complaints. The milky juice called *Yercum paul*, the Tamul practitioners reckon among their purges.” As the *Yercum* is the darker flowered variety of the *Calotropis gigantea*, corresponding in that respect with *C. procera*, part of the virtues assigned to it may perhaps properly belong to the *Procera*.

The following remarks on the medical uses of Mudar, I copied several years ago from a review in Johnson's *Medico Chirurgical Journal*, of a paper on Elephantiasis by Mr. Robinson of the Bengal medical service. Mr. R. informs us, that Mr. Playfair of the Bengal medical service, in speaking of the Mudar, emphatically describes it as a vegetable mercury, specific in the cure of lues, leprosy, and cutaneous eruptions. In general, the most powerful alterative perhaps known, an excellent deobstruent. In all affections of the skin says he, ‘ I have found it very effectual, and in the Jagara or Leprosy of the joints, I have never failed to heal up all the sores and often have produced a perfect cure. In Elephantiasis, Mr. Robinson agrees with Mr. Playfair that the Mudar is possessed of great virtues, he can also bear witness to its powerful effects as a deobstruent, and sudorific in almost all cutaneous eruptions arising from obstructed perspiration, and in apathy of the extreme vessels. It causes a sense of heat in the stomach, which rapidly pervades every part of the system, and produces a titillating feel upon the skin, from the renewed circulation

through the extreme vessels. It is inadmissible where the affection is inflammatory or the eruption pustular. He cannot recommend it as a substitute for mercury in the other complaints for which Mr. Playfair recommends it, but he considers it an admirable ally. "Where mercury has been used, but cannot be pushed further, the Mudar rapidly recruits the constitution, heals the sores, removes the botches from the skin, and perfects the cure. The Bark of the root is the only part used in medicine, and should be gathered in March, April, and May. When well dried it is easily reduced to powder, of which the dose is from three to ten grains." Since these remarks were published several additions to our stock of information regarding this plant have been made, to which I have not access at present.\* I more particularly refer to a paper on the subject by the late Dr. Duncan junior in the *Edinburgh Medical and Surgical Journal* for the year 1829-30, detailing the result of trials made by him in the royal infirmary of that place with remarks on its chemical analysis.

The native Doctors in this part of the country inform me, that the juice of the root causes violent vomiting and purging when taken in considerable doses; that they are in the habit of using the milky juice of the stem as an embrocation to discuss swellings caused by sprains and bruises, and also for relieving rheumatic pains. A more mischievous use of it is to induce abortion; it is said to produce the effect in the course of a few hours. The fact of this criminal employment of local stimulant applications by the natives I have long known, but did not know before that the Mudar was so applied. Poultices of the boiled leaves are applied to discuss glandular swellings, particularly about the neck, caused by cold. It is evident from this account that they have a very imperfect knowledge of its most valuable medical properties. This is not to be wondered at, considering their love of polypharmacy, which induces them to combine into a single prescription the most heterogeneous ingredients. Of the compound forms in what they use the milk, the simplest I could discover, was a liniment composed of equal parts of it and Margosa oil boiled together. The juice

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\* See note at the end of this paper. ED.

coagulates and comes to the top, and is removed: the clear oil which remains is supposed to be a powerful remedy against ~~the~~ <sup>the</sup> ~~parts~~ <sup>parts</sup> of the limbs. Perhaps the friction required in its application is of more use than the medicine. In some of the other combinations in which it is supposed to act a prominent part; it seems next to impossible to recognize its presence, being previously exposed to the action of fire two or three different times, so that unless it contains a notable quantity of saline matter, which is brought into a state of activity by the process, there is every reason to believe it altogether lost. It certainly does contain an alkaline ingredient, which has received the name of Mudarine, but whether it can be separated by such rude processes, I am unable to determine. If there is any reliance to be placed on the information above quoted from Roxburgh; it affords an interesting confirmation of a doctrine, becoming daily more firmly established; that spasmodic actions are produced by local congestions on the nerves supplying the affected muscles, which are removed by the powerful action of the medicine on the extreme vessels as particularly pointed out by Mr. Robinson. To the testimonies now adduced I have only to add, that I many years ago prescribed the *C. gigantea* in a case of Elephantiasis, but without producing any effect on the disease. After a few days use, it caused an intense itching and drawing sensation on the skin, but no other effect so far at least as I can recollect, and I have not now my notes of the case to consult.

As my object in this paper is rather to make known the plants, for the sake of others who may wish to investigate their properties, than to attempt to write a medical history of them myself; I shall here leave the subject in the hands of those who have better opportunities of following it out, to supply what I have left defective, and proceed to make a few observations on the properties of the order generally, so far as they are yet known, particularly of those species, natives of this country, with which we are more immediately interested. I do this as affording an example of the truth of a remark, in the review of Mr. Royle's work in your last number, that plants of the same natural order are generally found to possess properties similar in kind. This rule, I think I

shall be able to show, though true in the main, has, like all other general rules, its exceptions.

Milky plants, generally, are viewed with suspicion, ~~some~~ a proportion of them being endowed with ~~acrid~~ properties, and the asclepiadeæ, more particularly the roots, are supposed to possess these in an eminent degree, from so many of them acting as emetics, purgative, sudorifics, &c. Professor DeCandolle states, that the *Asclepias decumbens* of America, has the singular property of exciting general perspiration without increasing in any perceptible degree the heat of the body, and is on that account constantly employed in Virginia for the cure of pleurisy. In this country, we have several species, besides the *mudar*, the roots of which possess emetic and diaphoretic properties, and may at all times be used as substitutes for ipecacuana in either capacity, particularly in the cure of dysenteric affections, and also in many others for which that well known medicine is in daily use. The following list extracted from the works of Ainslie and Roxburgh contains a few of the principal of these, and no doubt there are many more in India, though unknown to us. Our ignorance of them is, perhaps, partly owing to the difficulty of distinguishing the plants, on account of their structure, till explained by Mr. Brown, being so little understood, that it was almost impossible to give an intelligible generic character; which will be apparent from the synonyms which I have added, from these authors, to the present names, ~~and~~ from the fact that Roxburgh has only described 31 species of the order found in India, out of nearly 150 species that actually exist. Now, that that difficulty is removed, it is to be hoped we will soon receive great accessions to our knowledge of the medicinal properties and uses of this very curious order.

| <i>Present names.</i> | <i>Ainslie's.</i> | <i>Roxburgh's.</i> |
|-----------------------|-------------------|--------------------|
| <i>Calotropis</i>     | <i>Asclepias</i>  | <i>Asclepias</i>   |
| <i>gigantea</i>       | <i>gigantea</i>   | <i>gigantea</i>    |
| <i>procera</i>        | "                 | "                  |
| <i>Tylophora</i>      | <i>Asclepias</i>  | <i>Asclepias</i>   |
| <i>tenuissima</i>     | <i>prolifera</i>  | <i>tenuissima</i>  |
| <i>asthmatica</i>     | <i>Asclepias,</i> | <i>Asclepias</i>   |
|                       | <i>volubilis</i>  | <i>asthmatica</i>  |

| Present names.         | Ainslie's.    | Roxburgh's.  |
|------------------------|---------------|--|
| Hoya                   | Asclepias     | Asclepias  |
| <del>veridiflora</del> | vomitorea     | volubilis  |
| Dæmia <del>mo.</del>   | Cynanchum     | Asclepias  |
| extensa                | extensum      | eichenata  |
| Gymnema                | Periploca     | Asclepias  |
| sylvestris             | estris        | gemenata   |
| Secamone               | Periploca     | } this plant is not mentioned<br>by either Roxburgh or<br>Ainslie. |
| emetica                | emetica Wild. |  |
| Hemidismus             | Periploca     | Asclepias  |
| indica                 | indica        | pseudosarsa.   |

I shall add a few remarks on each of these species except the two first, extracting as I go along the remarks of Ainslie and Roxburgh.

*Tylophora tenuissima* and *asthmatica*: of these two species the last is by far the most common, and I believe the most valuable. It is found in every part of India that I have yet visited, growing in all soils, but most abundant in sandy soil near the coast. It is a twining plant with rather small pale purplish flowers, usually coming off in tufts of three or four together from a common flower stalk, but, except in old clusters, all so near the apex, that this arrangement is not easily observed unless closely looked for. I believe the leaves are the palla kuray (*asclepias volubilis*) of Ainslie, but of that I am not quite certain. If so, it is rather remarkable that the leaves should be used as greens, while the root affords such an active medicine as *indica* does. It is the true *Asclepias vomitoria* of Koinig, which is ascertained by the examination of his own specimens so named. The plant so named by Ainslie differs widely in appearance, though possessed of somewhat similar properties. Roxburgh in his *Flora Indica* observes regarding this plant, that "on the coast of Coromandel, the roots have often been used as a substitute for ipecacuana, I have also often prescribed it myself and always found it answer as well as I could expect ipecacuana to do; I have also often had very favourable reports of its effects from others. It was a very useful medicine with our Europeans who were unfortunately prisoners with Hyder Ali, during the war of 1780—81—82 and 83. In a pretty large dose it answered as an emetic; in smaller doses often repeated, as a cathartic; and in both ways very effectually." He adds, "that owing to

the loss of his notes made when in large practice at the general hospital at Madras in 1776, 77 and 78, he cannot be so full on the virtues of this valuable and much neglected root as he could wish; but has no doubt that it would answer every purpose of ipecacuana. "The natives also employ it as an emetic; the bark of about three or four inches of the fresh root they rub on a stone and mix with a little water for a dose; it generally purges at the same time." To this is added a note from Dr. Russel who informs Roxburgh, "that Dr. Anderson, Physician General at Madras, had for many years before known it used both by European and Native troops in the dysentery which at that time happened to be epidemic in the camp. The store of ipecacuana had, it seems, been wholly expended, and Dr. A. finding the practice of the black doctors much more successful than his own, acknowledged that he was not ashamed to take instruction from them; which he pursued with success!" As "it is certainly an article of the Hindoo materia medica highly deserving of attention," I shall endeavour to make it better known by sending a drawing for insertion in a future number.

The *Tylophora tenuissima* is a smaller and much rarer plant; it is the *Nanjarapanjan* of Ainslie; the powdered roots of it are used as an emetic.

*Hoya veridiflora* (cooringa, Ainslie). This like the true *asclepias vomitoria*, is a very common and widely distributed plant. Ainslie informs that the "root is prized for its expectorant and diaphoretic qualities—an infusion of the root is prescribed as an emetic to children who are troubled with phlegm, and also in flux cases in which it would appear to prove beneficial by possessing virtues similar to our ipecacuana:" a decoction of the leaves is given in cases of indigestion and is said to act as a mild aperient.

*Dæmia extensa* (vaylie partie, Ainslie). This like the preceding is a widely distributed plant easily known from all the *asclepiadæ* of India, by its follicles being covered with soft fleshy inoffensive prickles, "hedge-hogged" Roxb. whence his name *echinata*.—The juice of the leaves of this plant is said to possess both emetic and purgative qualities, and to



be particularly useful in jaundice;—nothing more seems known concerning it.

*Gymnema Sylvestris* (serroo canchorie vayer, Ainslie). This twining plant tho' less abundant than the preceding is not uncommon. It is known by its dense clusters of small yellow flowers. The root is bitter and supposed by the natives to possess virtue<sup>m</sup> against snake bite. It is given in decoction and the powder<sup>xp</sup> applied to the bitten part. It is supposed by the Cyngalese to possess virtues similar to ipecacuana. (Ainslie.)

*Secamone emetica*: this plant was altogether unknown to Roxburgh, though not uncommon in the southern provinces of the peninsula in jungles near the foot of the hills. He supposed that it might be a narrow leaved variety of the next from which it is most distinct, neither is it mentioned by Ainslie, which surprises me. The natives, in the districts where it grows, seem to be generally aware that its roots are powerfully emetic; their information on that head, communicated to Dr. Koinig and myself at a long interval being the same, I consider satisfactory evidence of the fact.

*Hemidismus indica* (Nunnari vayer, Ainslie). A very common plant, now well known from being in general use in our hospitals under the name of country sarsaparilla. The root has a thin dry outside, and a thick mucilaginous inside bark, and does not seem to possess any of the emetic or purgative properties of the preceding species and is consequently, apparently<sup>a</sup> an exception to the rule; I say apparently, for the difference<sup>may</sup> be in degree only, not in kind.

I have now I think adduced sufficient evidence to prove, both the similarity and the value of the medicinal virtues residing in the roots of a large proportion of the plants of this order: we have less information concerning the parts exposed to the action of air and light, but we do know that *Ceropegia bubosa* is eat by the natives both raw and dressed, that *C. juncea* is made into pickles and generally used in that form, as well as eat raw; and that the young shoots of *Sarcostemma* (*Cynanchum*) *viminale*, (Kodicullie, Ainslie) *Asclepias acida* Roxb. is eat by the natives. Roxburgh remarks of it, that it affords a larger quantity of very fine milky juice than any other

plant he knows; that it is of a mild nature and acid taste, and that native travellers often suck the tender shoots to allay thirst. It is a twiner scarcely distinguishable from the milk hedge, except by its twining habit and clusters of flowers on the ends of the branches.—To these examples from the continental flora, we may add, that the milky juice of *Gymnema (Asclepias) lactiferum*, a Ceylon plant very closely resembling our *G. sylvestris*, is said to be so abundant and mild that the Cingalese constantly use it in place of milk.

If it be allowable in such a case to draw extended conclusions from a few facts, I think we may fairly infer, that two sets of properties reside in these plants: that the roots contain those of an acrid character, while the stem and leaves possess those of a mild or tonic description; these differences depending, perhaps, on the juices of the stem being more perfectly elaborated by exposure to air and light than those of the root.

I shall now conclude these remarks, which greatly exceed the limits originally intended, by expressing a hope that some of your readers whose tastes and talents qualify them for such enquiries, may take up the subject and communicate the result. There is a wide but little cultivated field before them, from which we may expect a rich harvest of valuable discoveries, towards the securing of which, I shall cheerfully lend my aid in naming, when necessary, the plants that have been subjects of experiment and observation.

Bellary, 15th November, 1834.

P. S. For the purpose of affording a practical illustration of the statement with which I have concluded the foregoing observations, I shall add one fact, known I believe to few Europeans, namely; that the Hindoos of the Carnatic, almost invariably give to their infants when only a few days old, a considerable quantity, in doses of two or three drops, of the juice of the milk-hedge, as a charm or prophylactic against the attack of a disease they call chowa or Tchuva, apparently, judging from their description, of an imaginary nature. To deprive the juice of its acrid corrosive properties, and fit it for this delicate application, the young shoots are slightly roasted, which opens the pores, and allows a clear watery juice to be wrung through them. What renders it curious that infants so young, should survive such treatment,

is, that the juice still retains so much of its acrid properties, that about an ounce of it, proves a drastic cathartic for a strong man, and mixed with a few grains of black pepper, one often used. The juice procured is slightly mucilaginous, of a greenish colour, and perfectly transparent. To the taste it is first insipid and then ~~sweet~~ and acidulous. It effervesces with alkalies, and on being mixed with a solution of nitrate of silver throws down a very copious white precipitate which soon turns black on exposure to the light; muriate of copper immediately changes it to green. The acid is therefore *muriatic*. The salt which imparts the taste, I have not yet ascertained, but from some rude chemical experiments which I made on the juice, I believe the subject well worthy the attention of your chemical readers: and think some interesting additions to our knowledge of vegetable chemistry, might be obtained from a careful analysis of the juices of the milky plants which abound in this country. Under this conviction I would strongly recommend those who have made chemistry their study, to devote some portion of their leisure to this investigation, as important medical as well as otherwise useful discoveries may result from the enquiry.

v.

W. R.

## NOTE:

Mr. Robinson's paper above referred to, is to be found in the *Medico-Chirurgical Transactions of London* vol. II. page 27. Mr. Robinson, considers "the world at large deeply indebted to Mr. Playfair for the discovery of the most valuable medicine hitherto derived from the vegetable kingdom," although he does concur with him, in ascribing to it all the virtues that gentlemen supposed it to possess.

There is a very elaborate paper on the virtues of Mudar by Mr. Playfair, in the 1st volume of the *Transactions of the Medical and Physical Society of Calcutta*, detailing a variety of cases treated with it by himself and other practitioners during a long series of years. It is remarkable that in the botanical description in that paper, furnished by Dr. Bachman Hamilton, the *Asclepias procera* and *Asclepias gigantea* occur as synonyms, but with the mark ? after each.

Dr. Cumin in the *Edinburgh Medical and Surgical Journal* for October 1827, in detailing five cases which were treated with Mudar in the *Lock Hospital*, Glasgow, says "In two it produced no benefit, in two it seemed to contribute to a successful result, and in one I am inclined to ascribe to it the completion of the cure. Being in its nature an alterative, though one of a highly concentrated character, many trials must be made, and a long period must elapse before its virtues can be satisfactorily ascertained." He continues, "Let us therefore not throw aside the Mudar with neglect, but be encouraged to make trial of this drug, which is productive of no deleterious ef-

fects and promises to be a valuable acquisition in many unmanageable forms of disease." It should be particularly observed that he never prescribed more than three or five grains, as in larger doses it acts as an emetic and its alterative effects are not obtained.

There is an interesting paper in the same journal for July 1829, by Dr. Duncan junior, on the chemical composition and properties of Mudar. Dr. D. in that paper arrives at the conclusion, that in every respect the action of the Mudar is similar to those of ipecacuan. The peculiar proximate principle contained in it, possesses the singular property of being soluble in cold water and gelatinising when heated to 80° or 90° Fahr. It excites speedy and abundant vomiting in the dose of one grain repeated to the third time.

There are two cases given in the 6th volume of the Medical and Physical Transactions of Calcutta—one an ulcer of twelve months standing, and upwards of sixteen inches in circumference in which all the former treatment had failed but yielded to two drachms and a half of the Mudar, given by Mr. L. Geddes of the Madras service. The other treated by Dr. H. Mackenzie was "a native boy aged 13 who had been ill twelve months with inveterate ulcers—the bones of the left forearm were bare and in a state of caries, there were numerous ulcers affording a very profuse discharge and sinuses about the forearm and elbow; the patient was miserably reduced and unable to stand. He had tried all the ordinary resources of the district without benefit." The Mudar was given in small doses, and at the end of five weeks from the time he had begun to take it, all the sores had healed and the boy was able to walk about.

In a paper read May 1824 by Mr. Twining before the Medical and Physical Society of Calcutta, of which an abstract is given in the society's circular for that month, he says "Mudar has been found very serviceable where the constitution has been injured by the improper exhibition of mercury or other violent remedies, and it has cured where Sarsaparilla has failed; at the same time it is observed, that it has happened in two or three cases out of near fifty, that Mudar has, after a time, ceased to act favourably." "In other cases, where mercury had been often used, but its employment omitted for many months, the patient remaining in misery, with severe pains and open ulcers—the Mudar has alone effected a cure."

The paper does not appear to have been published in this country: the following extract from the address of the Earl of Stanhope, as president of the Medico Botanical Society of London, at the Anniversary Meeting in January 1830, perhaps, affords an explanation of its not being inserted in the Calcutta Transactions. "It remains for me to speak of an admirable paper of Mr. Twining at Calcutta, of which the first part was read at a Meeting of this Society, and will be found, from its merits and importance, to be eminently entitled to the Gold Medal, unless it should already have been published, a point upon which we are not at present informed. It relates to a species of *asclepias*, which is common in Hindoostan, where it is known by the name of *Mudar*, and is an active, valuable, and safe Medicine, that may be employed in many cases of chronic disease. The milky juice of the plant operates as a violent cathartic, but is used externally to promote suppuration, and for the cure of the herpes serpigio, as the leaves are also in cases of rheumatism. The dried flowers, and the inner bark of the root, in powder, are considered of service in anasarca and the ascites of mere debility; and its root, in powder is also administered in eruptions and other complaints. It thus appears that several parts of the plant are medicinal, but Mr. Twining

employed only the inner bark of the root, in powder; and the complaints in which it was attended with success (though in many instances they had long remained intractable and had resisted other medicines) were ulcers, even such as were attended with caries of the bones, cutaneous eruptions, and nodes or a thickened state of the periosteum. It was given in small doses, sometimes of one or two grains, and was most effectual when the patient had no febrile tendency was not of a plethoric habit, and adopted a proper regimen. The author relates, with a minuteness and accuracy which are as honorable to himself as they are satisfactory to others, the symptoms and treatment of nine cases in which Mudar was administered alone, and of seven in which it was combined with sarsaparilla, which 'assists, modifies, and directs,' its effects, and promotes the cure by preventing or diminishing the irritability of the constitution. It had been tried with success in thirty-five cases by Mr. Egerton, Surgeon to the Eye Infirmary at Calcutta; and the ten cases, in which it was given by the former without benefit, were of patients who were plethoric, inclined to fever, or of an irritable habit. The author gives, also, the analysis of the *Madar* powder, which can be procured from Mr. Mackenzie, No. 78, Cornhill."

Dr. Duncan observes, that "by almost all the writers on the subject, it is said to be the root of the *Asclepias gigantea*. But this is a mistake. Dr. Francis Hamilton has, in his learned commentary on the Second part of the Hortus Malabaricus, described the species of the genus *Asclepias*, L. (*Calotropis*, Brown), which he found in India. They are three in number."

"*Calotropis gigantea* is the Erica of the Hortus Malabaricus, the *Madorius* of Rumphius, the *Akhund* of the Hindoos."

"To the second he gives doubtfully the trivial name of *procera*, as if uncertain whether it were the very species described by Welldonow, which is indigenous in Persia. It would appear that he afterwards considered them as distinct species, and gave to the Indian plant the name of *Calotropis mudarii*. It is the *Madar* of the Hindoos. The more detailed description inserted in Mr. Playfair's paper is also by Dr. Hamilton."

"But the most accurate medical information concerning the plant which furnishes the *Madar*, as to its diagnosis from *C. gigantea*, is contained in the printed circular notice of the proceedings of the Calcutta Medical and Physical Society for March 1824. For a series of these very interesting papers, I am indebted to the kind attention of Dr. Adam, secretary to the society." The following extract from the circular corresponds accurately with Dr. Wight's descriptions, and although it may be still doubtful, whether the *Mudar* is the same species as that to which the specific name of *procera* was originally given, no difficulty can hereafter be experienced, in ascertaining the plants to which medicinal virtues have been ascribed. "Dr. Wallich exhibited specimens, in full flower, of the varieties of *Asclepias* termed by the Natives *Mudar* and *Akhund*, and explained to the meeting the characters which distinguish each. The former is the genuine one described by Mr. Playfair, as useful in elephantiasis and other cutaneous affections. It is a small plant, having a perennial root, but an annual stem, while the *akhund*, (both the purple and white flowered,) attains comparatively a great height, and is altogether perennial. The flowers of the *Mudar* form a cuplike corolla, while those of the *Akhund* are reflected on themselves. The *Mudar* is not found indigenous below the Province of Bahar, and affects chiefly dry sandy soils; while the other variety is common all over the country, and

flourishes in great perfection in Bengal Proper. They have been lately termed, (by Hamilton,) *Calotropis mudari*, and *Calotropis gigantea*. Dr. W. concluded by observing, that nothing can be more distinct in habit, duration, and flowers, than these two plants : in medicinal virtues, they are probably still more different."

The confusion in which the subject illustrated by Dr. Wight is still involved, appears from the fact, that Dr. Whitelaw Ainslie in the last edition of his *Indian Materia Medica* represents the *asclepias gigantea* as the true Mudar ; and in a paper on Elephantiasis published in the first volume of the *Transactions of the Royal Asiatic Society*, which has been much admired for the accurate research displayed by its author, the same mistake is repeated. As the transactions of the parent Society are not generally accessible, and for the sake of Mr. Colebrooke's notes, the following extract from the first volume is here inserted. It is singular that the transactions of the Calcutta Medical and Physical Society are twice referred to under the name of the 'Edinburgh Medical Transactions,' a mistake which could not possibly have originated with the author. "But of all the alterative and deobstruent remedies employed by the native practitioners of India in this complaint, none is of equal repute with the concrete milky juice of the plant called by the Tamools *Yercam* (*Asclepias gigantea*) ; it exudes from the leaves and tender shoots on being pricked, and has at first somewhat the appearance of cream ; but on drying becomes a little darker coloured, and has a rather nauseous and acrid taste : the dose is about a quarter of a gold pagoda weight, given twice daily, together with a little sulphur, and, continued for some weeks. The plant is termed, in Sanscrit, *Arca*, also *Vásuca*, and *Pratápasa*.\* In the Canarese language it is *Fécádá* ; in Hindustáni it is named *Madár* ;† in Dukhíni, *Akré* ; in Javanese, *Wáduri* ; and in Arabic, *U'sher*, according to *Avicenna* (233), though it would appear that in Arabia Felix, the *Asclepias gigantea*‡ has got the appellation of *Oschar*, which, however, may be a corruption of the same word. In the *Materia Medica* of Hindustan, above cited, which I published at Madras in 1813, will be found (page 128) some account of the *Yercam* plant (*Asclepias gigantea*), and its use amongst the Hindu doctors ; also some notice of what has been by some considered as a variety of the same plant, and termed in Tamool *Vallerkú* ; but I have since had reason to believe that this last is of a different genus altogether, and what was named by the late excellent Dr. Klein, of Tranquebar, *E'vacum hyssopifolium*, and is in all probability that which is said to be often confounded with the true *Asclepias gigantea*, in the upper provinces of India, and there called *Akand*.§ I have said, that the dried milky juice of the *Asclepias gigantea* was considered in southern India as powerfully alterative ; and late accounts, which I have received from that country, tend the more to convince me of it : I should therefore venture a query, whether, as such, it might not be tried in cancer, that most intractable of all

\* "The *Arca* or *Vásuca* is the rose variety ; the *Pratupasa* or *Aturca*, is the white sort.---H. T. C."

† "From the Sanscrit, *Manddra*.---H. T. C."

‡ "The reader will find farther notice of this plant in Springel's '*Rei Herbaria*' vol. i. 252, 253 ; also in '*Abu Hanifa abud Serap*,' cap. 50 ; also in '*Alpinus' Egypt*."

§ "In the *Hortus Bengalensis*, published by Dr. Carey, from Dr. Roxburgh's *M.S.*, *Akand* is given as the *Hindú* name of *Asclepias gigantea*."

maladies. The bark of the root of the *Asclepias gigantea*, as it appears in the bazars of lower India, is of a pale colour, and has a bitter, and somewhat nauseous and pungent taste: the natives consider it as alterative; also as a gentle stimulant, taken in decoction to the quantity of two table-spoonfuls twice daily: and Rheede, in his *Hortus Malabaricus*,\* where the plant is mentioned under the appellation of *Ericu*, says, that a decoction of its root is given in intermittent fever, and in those swellings of the limbs which women sometimes have after confinement. The powder of the bark of the root of the *asclepias gigantea*, called in Bengal *madák* powder, has been highly extolled of late as a valuable remedy in lues venerea, leprosy, and cutaneous diseases in general. Mr. Playfair, in a paper already mentioned, and which may be seen in the first volume of the Edinburgh Medical Transactions, goes so far as to say that it is one of the most useful medicines hitherto derived from the vegetable kingdom; and it would seem, by an excellent paper on "*Elephantiasis as it appears in Hindustan*," by Mr. Robinson, that he also bears witness to its powerful effects as a deobstruent and sudorific, in almost all cutaneous eruptions; the dose of this powder is from three grains to ten."†

M.

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IV.—*A description of a set of Balances made for the purpose of delicate weighing; illustrated by drawings. By Lieut. J. Braddock.*

EDITOR OF THE MADRAS JOURNAL OF LITERATURE & SCIENCE.

Sir,

I have the pleasure to send you a description and drawings of a set of balances which I made a few years ago for the purpose of delicate weighing. My object in constructing them being efficiency with simplicity of parts they are not so elaborately finished as delicate balances usually are, but they are fully adequate to all the purposes of the private experimentalist, who might not be supposed to have his finer balances in continual daily use.

2. The mechanical principles of the balance are too well understood to require a detail of them. I shall therefore simply mention that the knife edge of the fulcrum and the points suspending the scale pans must lie in a right line; and that the centre of gravity of the beam must not be above this line or the beam will overset, nor must it be too much below the line, or the vibrations of the beam will be too rapid, and the delicacy of the balance will be diminished and impaired.

3. I have four balances for weighing all quantities from

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\* See *Hortus Malabaricus*, part ii. page 55

† Transactions of the Royal Asiatic Society of Great Britain. Vol. I. Page 300.

one grain to ten thousand. They have one support and one glass case in common to them all: the beams not required are kept in a box fitting in at the back of the glass case, so that they are always at hand. Fig. 12 is a perspective sketch of the case with one of the balances mounted. The figure speaks for itself.—It has a glass slide to close the front, and the usual contrivances of an ~~any~~ balance for relieving the beam and scale pans, and for adjusting the level.

4. The most delicate balance that I have is used for weights not exceeding 10 or 20 grains. It is made simply of a piece of well seasoned, clean, straight grained fir; and figure 1 is a representation of it. The knife edge works on a plane of agate; it is made of steel and was tempered as a workman would say “dead hard,” being afterwards very carefully sharpened on a hone, and examined by a microscope. The edge is a perfectly straight line, smooth, well defined, not wiry, not a sharp cutting edge but rather slightly round, so that it may be firm enough to withstand the wear and tear that may be required of it, and yet be nothing more than a line, presenting no resistance, but acted on when in the beam by the slightest weight. Figure 2 represents the fulcrum and the centre part of the beam of the real size: the brass *a*, is screwed down by the screws *b*, *b* having a plate of brass *c*, under them to prevent the heads penetrating the wood. The beam *d*, is notched out for the fulcrum *e*, to lay in, and the brass *a*, very securely fixes it in its position, care being taken that the notch is made at a right angle, and that it is not too deep.” The fulcrum should project a little above the beam so that the securing brass *a*, may press firmly upon it. The points *a*, *a*, fig. 1 were put in at as nearly equal distances from the centre as could be measured by a pair of compasses; for I did not intend the beam to be a balance of perfect equipoise, knowing the extreme difficulty of adjustment to quantities so minute as  $\frac{1}{10000}$ th or  $\frac{1}{10000}$ th part of a grain.

5. Fig. 3, shews one end of this balance of the real size. The point *a*, is a piece of hardened steel wire with a screw on it, screwing up tight through the wood of the beam *b*, and being further secured by the tightening nut *c*. The point is extremely fine and sharp, but carefully made, and proved or



tested by pressing it upon a piece of wood to ascertain that it neither bent, nor broke; being afterwards examined by the microscope.—The wire d, is the pointer, the point of it being a continuation of the right line of the fulcrum and the points of suspension for the scale pans. The end of this wire entering the beam was hammered flat, a slit was cut down the end of the beam, and the wire thrust in and tied securely with a piece of twisted silk thread as at g.

6. The scale pans of this balance are supported in the simplest manner I could devise. The crank piece e, fig. 3. is a piece of common brass wire flattened on the top, hammer hardened and polished underneath where it rests on the beam point a. This crank piece has a hook or hole at the bottom i. e. at f, and another piece of brass wire fig. 4. hooks on it, the lower end of this wire fig. 4. being bent at right angles into a triangular shape for the purpose of supporting the scale pans, which are small thin dishes one inch in diameter.—The ball over the fulcrum f, Fig. 2. is common to all the balances, i. e. each balance has one; it is for the purpose of raising or lowering the centre of gravity, and the wire g, is for the purpose of adjusting the equilibrium of the balance before it is used.

7. The sensibility of this balance is very great, in fact so much so, that it is extremely difficult and tiresome to weigh with it. When 20 grains are in each scale the  $\frac{1}{10000}$ th part of a grain occasions the pointer to move over 3 divisions of the index, which is graduated in 10ths of an inch; supposing with 20 grains in each scale the index points at nonius, or nothing, the addition of  $\frac{1}{10000}$ th of a grain causes the pointer to move over a space of  $\frac{3}{10}$ ths of an inch, so that the balance indicates decisively to  $\frac{1}{10000}$  part of a grain which causes the pointer to move over  $\frac{1}{2}$  a division or  $\frac{1}{20}$  of an inch, a quantity quite large enough to produce an indication that may be depended on. In fact half that quantity or  $\frac{1}{20000}$ th part of a grain may be estimated, but all who know the difficulties of such minute weighing are aware that such statements appear much finer and more scientific on paper than they are to be depended on in practice.

8. A balance like this must be used with the utmost possible care, not as I once saw a gentleman use an assay balance,

giving it a good hearty shake "because its indications were sluggish." The least accident deranges so delicate an instrument; the slightest breath of air, a particle of dust, or unskilful management. The difficulty in delicate weighing is to make a balance always agree with itself, which it will not do unless it is in perfect order, and unless it is under the sole care of one who is completely master of its peculiarities. Few practical men will have a good balance like another to use it.

9. I must add that the way to use this balance is this: suppose you wish to ascertain the accuracy of a given weight. Place a known accurate weight in the right hand scale, and equipoise it by counterweights in the other. When perfectly equipoised, take it out and put in the weight you wish to verify, then if on the second trial an equipoise is produced, the two weights are equal. Or if you wish to ascertain the exact weight of any small substance, place it in one scale and balance it by counterpoise weights in the other: remove it and by real weights produce an equipoise and the true weight results. This is in fact the only accurate method of weighing, for the best balances are seldom *perfectly* correct, particularly after they have been in use for some time.---It is very difficult to adjust delicate balances so as to be *perfect equipoises*, though the adjustment may be made so very near the truth as to be a matter of no consequence for any ordinary practical purpose.

10. My second balance weighs any quantity not exceeding 200 grains and indicates to the  $\frac{1}{1000}$ th part of a grain. Figs. 5, and 6, represent the central portion, and the index end of this balance of the full size. The length of the beam is the same as in Fig. 1.—The general construction is the same in principle as the balance just described, but being designed for more frequent use the beam is made of steel, which by means of linseed oil put on it and burned off over a fire was blackened and covered with a sort of varnish that prevents its rusting. The fulcrum is a piece of square steel wire made dead hard by heating it cherry red, and plunging it into cold water. Then as in the former case working it to a proper edge on the hone. In fig. 5, a, is a piece of brass

screwed down upon the beam *b*; securing the fulcrum *c*; which is further fastened by the bottom end of the upright wire *d*, entering a hole made to receive it on the upper part of the fulcrum. This prevents side motion, the wire being screwed through the brass *a*.---The ends of the beam fig. 6, are tipped with brass, and the point *a*, slides in a small groove made ~~for~~ to receive it, and is secured by the tightening nut *b*. ~~The~~ thick end of the pointer *c* is screwed through the end of the brass *d*, and abuts against the point *a*, affording the means of adjustment by thrusting the point *a*, towards the centre of the beam:—*e* is a tightening nut to make the pointer *c*, secure.—A plain piece of wire with a screw on it, is used also at the other end of the beam for the same purpose.—I shall presently state the method I used for adjusting the beam to make it an equipoise.

11. The scale pans of this balance are suspended by a loop, figure 7, where *a*, is a small steel screw passing through the top of the loop, having a shallow cup or dishing at the bottom to prevent its sliding off the point, which with the end of the beam is shewn inside the loop. This small concavity is finely polished, and is intended by being concave simply to secure the loop from *vandering*, or slipping off the point but it does not at all interfere with the delicacy or sensibility of the balance, which it might do were it not carefully formed, and made as shallow as possible with reference to the use required. The wire bent into the figure of an 8 with the three ~~ends~~ <sup>ends</sup> attached to it represent the manner in which the scale pans are secured, the lines being merely silk thread.—This balance is a very good instrument, and its indications are satisfactory and may be depended on with from 100 to 200 grains in each scale to the  $\frac{1}{100000}$ th part of the weight.

12. To make this balance an equipoise I proceeded thus. I adjusted the points in the beam as nearly as I possibly could to equidistances from the fulcrum, and then made the beam balance, or point to nonius on the index.—The scale pans with the loops complete were then made perfectly equal in weight. They were then attached to the beam and two perfectly equal weights of 100 grains each were put into the pans, one in each pan, and the balance tried. The end that

was the heaviest was adjusted by thrusting the point by means of the before mentioned screws nearer to the centre of the beam. When it was correct or very nearly correct I took off the scale pans and reversed them by placing them on the opposite ends of the beam, and on trying them in this position I found they gave the same indication, which was a proof that the two scale pans and weights were equal, and one not heavier than the other. After a whole day's trial however I found I could not adjust to perfect accuracy and so I left the balance out of equipoise about  $\frac{1}{10000}$ th of a grain in 100 grains. This error is equal to the 50,000th part of the weight which is quite accurate enough for even delicate purposes, but the error being known it is obvious that subtraction or addition is all that is required in order to arrive at a perfectly correct result should a greater degree of accuracy be required.

13. Figure 8 represents my third balance which is adapted to weighing quantities from 100 to 2000 grains. Though not so sensible in its indications as the last described balance, it is fully adequate to most experimental purposes falling within the weights just specified. Its sensibility at first was very great but having been in considerable use its delicacy of indication has become considerably diminished;  $\frac{1}{1000}$ ths or the 50th part of a grain however, still gives a decided result with 2,000 grains in each scale which is equal to the  $\frac{1}{100000}$ th part of the weight. Sir M. Faraday in his chemical manipulation tells us that a balance is an exceedingly good one if it indicates to the 50 or 60 thousandth part of the weight.

14. It will be perceived by Fig. 8, that the central portion of this balance which is represented of the real size, is exactly similar to the last. It requires therefore no description, the former description in Para. 10, will answer for both. The means of adjustment, however, and the bearing points are different. The balance is equipoised before using it, not by a small moveable wire as g, figure 2, but by means of a small ball a, screwing along the wire b, b, figures 9 and 10:---and the bearing or suspending points at each end of the beam are double. Fig. 9, is a plan, and figure 10 is a front view of the manner in which the points are fix-

ed: these views are sketches of the left hand end of the beam, or the end opposite to the pointer end. In both figures c, and d, are pieces of brass, the piece d, being firmly and securely fixed in the end of the beam, and the piece c, sliding in a groove and having liberty to move a small space to and fro as shewn in fig. 10. Small screws e, e, pass through the brass d, and thrust the brass c, which carries the points, towards the fulcrum; the wire b, fig. 9, has a shoulder abutting against the end of the beam, and passing into the beam is screwed and tapped into the brass c, so that when the screws e, e, are loosened this screw acts in the opposite direction or pulls back the points away from the fulcrum, the brass c, having liberty as before stated to move to and fro in the groove; it is evident therefore that this contrivance is competent to the adjustment of the balance, although the brass carrying the points at the other or pointer end is permanently fastened in the beam. I have only to add that f, in figs. 9, and 10, is a tightening screw, to fix more securely the brass c, after the adjustment has been effected. The adjustment was made as before, only with 1000 instead of 100 grains in each scale.

15. The scale pans are supported in the manner exhibited by figure 11; the points enter small polished concavities in the screws a, a, as described in figure 7, Para 11. (which see.)—I have adopted double points because the weights for which this balance is used are heavier, and because they are more convenient in practice, there being no wandering, or twisting of the scale pans. My fourth balance is precisely similar to the 3rd only stronger and calculated to weigh from 1000, to 10,000 grains.

J. B.

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V.—\* *Astronomical Tables and Observations.* By Goday Vencat-Juggarow.

To the Editor of the *Madras Journal*  
of Literature and Science.

SIR,

I have often heard it remarked, that this is an age of improvement in every department of knowledge; whatever may

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\* We have much pleasure in giving insertion to the following letter and its accompanying tables, the calculation of which would have reflected credit, on the talents and industry of a member of an Eu-

be the case with respect to other countries, I am sure that this observation is peculiarly applicable to India; it was from the general desire for information which has lately actuated my countrymen, that about 18 months ago I selected the divine science of Astronomy as the study and pursuit most congenial to my disposition and best calculated fully to occupy my attention: as it had fortunately fallen under my notice that many persons very imperfectly acquainted with the mathematics appeared (notwithstanding their perusal of the works of many eminent writers on Astronomy) to be unable to comprehend even the leading principles on which it is founded, I next resolved to aspire above a mere general idea, and to obtain a more than superficial knowledge of the sublime mysteries of the science; for this purpose I commenced a regular study of Euclid, Algebra, &c. and lately have acquired a considerable degree of practical as well as theoretical knowledge, and in proportion as I have increased my stock of knowledge, in the same degree has my desire for further improvement and making myself useful increased; it was from this feeling that on a late occasion when my friend the Hon'ble Company's Astronomer was so obliging as to explain to me the means adopted by Astronomers for predicting the Eclipses of the Sun, and Occultation of the fixed Stars, that the possibility of constructing a table to facilitate the computation occurred to me, the result of a little reflection and some labour has produced what I desired, which I have taken the liberty to beg you to insert in the Madras Journal of Literature and Science; this table with the assistance of the Nautical Almanac will afford a ready means of discovering when occultations will happen, and persons possessed of a Telescope and Regulator will be enabled to determine the longitude to a very great degree of

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ropean university, and which are deserving of particular admiration and praise, when considered as the production of a native of this country, who must have laboured under peculiar disadvantages in studying the difficult though interesting science of astronomy in a foreign language.—We trust that the distinguished success, which has attended the labours of Goday Venkat Juggarow, may serve to encourage his countrymen in the prosecution of the study of this, and the other branches of science, and we hail this display of talent as a bright specimen of “the march of mind” among the members of the native community of Southern India.—Ed.

accuracy—I am far from attaching any particular importance to this trifle, but as an Astronomical table formed upon modern research, it is I believe the first ever constructed by any of my countrymen in this part of the peninsula, and as such will, I hope, meet with your protection and favour. In order to shew the principle and utility of the table I have thought it necessary here to give an example of an occultation and of an eclipse of the sun as follows. On consulting the Nautical Almanac it appears that on the 8th of November 1834  $\times$  Capricorni will be occulted by the Moon at some part of the *Earth* and *probably* will be visible at Madras at about 2h. 30m. Greenwich mean time; to discover *if it will be visible* I proceed as follows.

|                     |          |          |          |
|---------------------|----------|----------|----------|
|                     | <i>h</i> | <i>m</i> | <i>s</i> |
| Greenwich Mean Time | 2        | 30       | 0        |
| Longitude of Madras | 5        | 21       | 9        |
| Madras Mean Time    | 7        | 51       | 9        |

at which moment the angle from the meridian is  $21^{\circ} 15m$ . computing from the Nautical Almanac.

|  | Right Ascension. |          |           | Declination. |                |          |
|--|------------------|----------|-----------|--------------|----------------|----------|
|  | <i>h</i>         | <i>m</i> | <i>s</i>  | <i>o</i>     | <i>'</i>       | <i>"</i> |
| The Moon's Mean                              | 21               | 34       | 7, 79     | 19           | 18             | 28 S.    |
| Correction from the table                    | —                | 1        | 24, 75    | +            | 29             | 20       |
| The Moon's apparent                          | 21               | 32       | 43, 04    | 19           | 47             | 48       |
| The star's from Nautical Almanac.            | 21               | 33       | 24, 53    | 19           | 36             | 59       |
| Difference.                                  |                  |          | 0, 41, 49 |              | 10             | 49       |
| Moon's Declination.                          | 19               | 47       | 48        | Secant       | 0, 0 2 6 4 6 5 |          |
| Difference Right Ascension of Moon and Star. |                  | 10       | 22        | A. R. Log.   | 8, 9 7 7 5 7 2 |          |
| Difference declination                       |                  | 10       | 49        | Log.         | 1, 0 3 4 2 2 7 |          |
| Angle at Moon.                               | 47               | 31       | 00        | tangent.     | 0, 0 3 8 2 6 7 |          |
|  |                  |          |           | Co sect.     | 0, 1 3 2 2 5 3 |          |
| Difference Declination.                      |                  | 10       | 49        | Log.         | 1, 0 3 4 2 2 7 |          |
| Distance of Moon's centre from the Star.     |                  | 14       | 40        | Log.         | 1, 1 6 6 4 8 0 |          |

The moon's semidiameter being  $15' 24''$  shews that the star is already occulted; repeating the computation for 7 h. 41 m. 9 s. or 10 minutes before the above time, I find the

distance 17' 10" shewing that the occultation will not then have taken place, and by interpolation I find that it will take place at 7h. 48m. 13s.\*

Computation of the eclipse of the sun for November 19th 20th 1835. From the Nautical Almanac it appears that the above eclipse of the sun will be visible at Madras, and by a rough approximation, with the assistance of the table, I find it will commence at 19h. 23m. Greenwich Mean Time, or November 20d. 4h. 28m. 9s. Madras Mean Time: for this moment the horary angle 70° 12' and

|                                 | Right ascension |    |               | Declination. |     |       |
|---------------------------------|-----------------|----|---------------|--------------|-----|-------|
|                                 | h.              | m. | s.            | °            | '   | "     |
| The Moons Mean                  | 15              | 42 | 19. 9         | 19           | 33  | 47 S. |
| Correction from the table       | —               | 3  | 59. 6         | +            | 19  | 49    |
| Moons apparent.                 | 15              | 34 | 20. 3         | 19           | 53  | 36    |
| Suns apparent.                  | 15              | 40 | 41. 2         | 19           | 36  | 35    |
| Difference .....                |                 | 2  | 20. 9         |              | 17. | 1     |
| Moon's declination              | 19              | 33 | 47 secant.    | 0, 0         | 26  | 28 4  |
| Difference in space             |                 | 35 | 12 A. R. Log. | 8, 45        | 32  | 11    |
| Difference of Declination       |                 | 17 | 1 Log.        | 1, 23        | 09  | 08    |
| Angle at the Moon               | 27              | 10 | 25 } tangent. | 9, 71        | 04  | 03    |
|                                 |                 |    | } Co-Sec.     | 0, 34        | 03  | 60    |
| Difference of Declination       | 17              | 1  | Log.          | 1, 23        | 09  | 08    |
| Dist. of centres of sun & moon. | 37              | 16 | Log.          | 1, 57        | 12  | 68    |

Now the sum of the semidiameters of the Sun and Moon being 32' 57" it appears that the eclipse has not commenced at 4-h. 28m 9s; if we therefore repeat the computation for 10 minutes later, the distance of the centers of the Sun and Moon is 33' 28" shewing that the eclipse has not yet commenced, and by interpolation it appears that the time of commencement is at 4h. 39m. 5s. Madras Mean Time. Hoping the above will fully explain the utility of the table,

I beg to be

Your most obedient

and humble servant

GODAY VENCAT JUGGAROW.

\* Since writing the above the occultation of  $\alpha$  Capricorni has been observed at the Honourable Company's Observatory at 7h. 45m. 4s.



*A Table shewing the amount of Parallax of the Moon; in Right Ascension in Time, computed for Madras. Argument at top Declination of the Moon; at the side, the angle from the Meridian.*

| P  | 0°                 | 4°                 | 8°                 | 12°                | 16°                | 20°                | 24°                | 28                 |
|----|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 0  | <i>m.s.</i><br>0.0 | <i>m.s.</i><br>0.0 | <i>m.s.</i><br>0.0 | <i>m.s.</i><br>0.0 | <i>m.s.</i><br>0.0 | <i>m.s.</i><br>0.0 | <i>m.s.</i><br>0.0 | <i>m.s.</i><br>0.0 |
| 10 | 0.41               | 0.41               | 0.41               | 0.42               | 0.43               | 0.44               | 0.45               | 0.47               |
| 20 | 1.21               | 1.21               | 1.22               | 1.23               | 1.24               | 1.26               | 1.29               | 1.32               |
| 30 | 1.58               | 1.58               | 2.0                | 2.1                | 2.3                | 2.6                | 2.10               | 2.14               |
| 40 | 2.32               | 2.32               | 2.33               | 2.35               | 2.38               | 2.41               | 2.46               | 2.52               |
| 50 | 3.0                | 3.1                | 3.2                | 3.4                | 3.8                | 3.12               | 3.18               | 3.25               |
| 60 | 3.24               | 3.24               | 3.26               | 3.28               | 3.32               | 3.37               | 3.43               | 3.51               |
| 70 | 3.40               | 3.41               | 3.43               | 3.45               | 3.49               | 3.54               | 4.1                | 4.10               |
| 80 | 3.50               | 3.51               | 3.53               | 3.55               | 4.0                | 4.5                | 4.12               | 4.21               |
| 90 | 3.53               | 3.54               | 3.56               | 3.59               | 4.3                | 4.8                | 4.15               | 4.25               |

1835.]

*A Table exhibiting the amount of Parallax of the Moon in Declination. Argument at top, Declination of the Moon; at the side, the angle from the Meridian.*

| P  | 28° N  | 24° N  | 20° N | 16° N | 12° N | 8° N  | 4° N  | 0° N  | 4° S  | 8° S  | 12° S | 16° S | 20° S | 24° S | 28° S |
|----|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0  | -15.28 | -11.23 | -7.15 | -3.4  | 1.7   | 5.18  | 9.27  | 13.34 | 17.36 | 21.34 | 25.25 | 29.9  | 32.44 | 36.10 | 39.25 |
| 10 | -15.21 | -11.13 | -7.3  | -2.51 | 1.18  | 5.31  | 9.41  | 13.34 | 17.51 | 21.49 | 25.40 | 29.20 | 32.52 | 36.15 | 39.27 |
| 20 | -14.1  | -9.25  | -6.12 | -2.15 | 2.1   | 5.58  | 9.55  | 13.34 | 18.38 | 21.25 | 25.5  | 28.35 | 31.56 | 35.8  | 38.9  |
| 30 | -11.54 | -8.4   | -4.42 | -1.0  | 2.56  | 6.36  | 10.14 | 13.34 | 17.17 | 20.46 | 24.2  | 27.15 | 30.20 | 33.16 | 36.2  |
| 40 | -9.26  | -5.49  | -2.35 | 0.46  | 4.8   | 7.24  | 10.33 | 13.34 | 16.48 | 19.52 | 22.47 | 25.36 | 28.18 | 30.51 | 33.14 |
| 50 | -5.37  | -2.52  | -0.6  | 2.54  | 5.37  | 8.20  | 11.2  | 13.34 | 16.17 | 18.48 | 21.12 | 23.30 | 25.41 | 27.45 | 29.43 |
| 60 | -1.36  | 0.45   | 2.58  | 5.10  | 7.21  | 9.30  | 11.35 | 13.34 | 15.37 | 17.32 | 19.22 | 21.7  | 22.43 | 24.14 | 25.38 |
| 70 | 2.52   | 4.30   | 6.7   | 7.42  | 9.12  | 10.43 | 12.13 | 13.34 | 14.56 | 16.12 | 17.26 | 18.29 | 19.29 | 20.24 | 21.12 |
| 80 | 7.30   | 8.31   | 9.30  | 10.25 | 11.19 | 12.8  | 12.53 | 13.34 | 14.14 | 15.4  | 15.32 | 15.56 | 16.15 | 16.26 | 16.35 |
| 90 | 11.47  | 12.13  | 12.35 | 12.55 | 13.11 | 13.23 | 13.31 | 13.34 | 13.35 | 13.31 | 13.24 | 13.12 | 12.56 | 12.37 | 12.14 |

*N. B.—The above tables are computed for a Horizontal Parallax 60', from which the numbers due to any other value can easily be deduced.*

## METEOROLOGICAL REGISTER KEPT AT THE MADRAS

|       | Standard Barometer No. 3 by Gilbert. |          |        |         |         |         |          | Standard Therm. by Troughton. |          |            |         |         |         |          |
|-------|--------------------------------------|----------|--------|---------|---------|---------|----------|-------------------------------|----------|------------|---------|---------|---------|----------|
|       | Sun Rise.                            | 10 A. M. | Noon.  | 2 P. M. | In Set. | 8 P. M. | 10 P. M. | S. Rise.                      | 10 A. M. | Aft. Noon. | 2 P. M. | S. Set. | 8 P. M. | 10 P. M. |
| Sept. | In a.                                | Ins.     | Ins.   | Ins.    | Ins.    | Ins.    | Ins.     | °                             | °        | °          | °       | °       | °       | °        |
| 1     | 29,898                               | 29,958   | 29,934 | 29,878  | 29,864  | 29,908  | —        | 80,0                          | 84,7     | 86,1       | 86,9    | 85,0    | 84,0    | —        |
| 2     | ,938                                 | ,976     | —      | ,924    | ,908    | ,932    | ....     | 82,4                          | 82,3     | —          | 84,1    | 84,5    | 83,7    | —        |
| 3     | ,890                                 | ,960     | ,940   | ,902    | ,854    | ,892    | ....     | 81,6                          | 83,5     | 85,2       | 85,2    | 85,3    | 83,3    | —        |
| 4     | ,890                                 | ,952     | ,936   | ,870    | ,851    | ,864    | ....     | 81,8                          | 84,0     | 86,2       | 86,0    | 84,7    | 83,8    | —        |
| 5     | ,920                                 | ,964     | ,950   | ,916    | ,902    | ,918    | ....     | 81,9                          | 84,1     | 86,8       | 88,1    | 85,8    | 84,0    | —        |
| 6     | ,946                                 | ,994     | ,958   | ,930    | ,918    | ,956    | ....     | 82,0                          | 82,0     | 83,6       | 84,8    | 82,3    | 82,5    | —        |
| 7     | —                                    | ,988     | ,954   | ,910    | ,916    | ,932    | ....     | —                             | 82,4     | 84,2       | 86,0    | 83,5    | 82,0    | —        |
| 8     | ,920                                 | ,950     | ,910   | ,872    | ,862    | ,880    | ....     | 80,8                          | 81,3     | 83,0       | 84,2    | 84,1    | 82,6    | —        |
| 9     | ,838                                 | ,888     | ,870   | ,838    | ,828    | ,848    | ....     | 80,9                          | 82,0     | 84,2       | 85,0    | 83,8    | 82,5    | —        |
| 10    | ,842                                 | ,866     | ,850   | ,820    | ,830    | ,860    | 29,868   | 80,9                          | 84,0     | 87,0       | 89,0    | 84,9    | 80,3    | 82,0     |
| 11    | ,850                                 | ,930     | ,908   | ,858    | ,862    | ,926    | —        | 81,0                          | 84,2     | 86,4       | 87,3    | 80,6    | 81,9    | —        |
| 12    | ,928                                 | ,978     | ,954   | ,916    | ,864    | ,904    | ....     | 80,9                          | 83,5     | 85,8       | 85,4    | 84,0    | 82,7    | —        |
| 13    | ,893                                 | ,958     | ,900   | ,858    | ,862    | ,904    | ....     | 81,0                          | 84,8     | 86,3       | 86,2    | 86,0    | 85,0    | —        |
| 14    | ,896                                 | ,970     | ,938   | ,905    | ,862    | ,896    | ....     | 80,8                          | 84,6     | 86,4       | 88,0    | 85,9    | 84,0    | —        |
| 15    | ,916                                 | —        | ,956   | ,912    | ,900    | ,930    | ....     | 81,0                          | —        | 86,6       | 87,0    | 84,1    | 83,1    | —        |
| 16    | ,950                                 | ,990     | ,962   | ,922    | ,916    | ,936    | ....     | 81,8                          | 84,9     | 87,0       | 87,5    | 84,9    | 84,0    | —        |
| 17    | ,904                                 | ,994     | ,954   | ,904    | ,900    | ,944    | ,946     | 83,2                          | 85,9     | 87,4       | 88,0    | 86,2    | 84,9    | 84,0     |
| 18    | ,916                                 | ,954     | ,930   | ,890    | ,890    | ,924    | —        | 81,7                          | 86,4     | 88,7       | 88,1    | 85,5    | 84,2    | —        |
| 19    | ,946                                 | ,966     | ,932   | ,918    | ,936    | ,956    | ,976     | 83,5                          | 84,6     | 86,3       | 87,0    | 84,6    | 83,9    | 82,8     |
| 20    | ,980                                 | 30,013   | 30,012 | ,976    | ,972    | ,993    | 30,016   | 83,1                          | 86,9     | 87,1       | 87,3    | 85,2    | 84,3    | 82,7     |
| 21    | 30,016                               | ,030     | 29,990 | ,938    | ,932    | ,958    | 29,968   | 83,0                          | 86,0     | 87,0       | 87,9    | 85,3    | 84,2    | 84,0     |
| 22    | 20,942                               | 29,986   | ,950   | ,890    | ,888    | ,912    | ,942     | 82,0                          | 86,2     | 88,7       | 89,9    | 88,0    | 85,2    | 84,0     |
| 23    | ,942                                 | ,950     | ,914   | ,894    | ,76     | ,916    | ,950     | 83,0                          | 86,0     | 88,8       | 88,6    | 85,4    | 85,0    | 84,5     |
| 24    | ,944                                 | ,968     | ,942   | ,884    | ,898    | ,932    | ,952     | 84,1                          | 87,1     | 88,7       | 88,4    | 85,0    | 84,2    | 83,8     |
| 25    | ,942                                 | ,998     | ,950   | ,904    | ,900    | ,936    | ,966     | 83,0                          | 87,2     | 87,9       | 87,8    | 85,9    | 84,8    | 84,1     |
| 26    | ,942                                 | ,976     | ,940   | ,890    | ,872    | ,922    | ,940     | 84,5                          | 87,5     | 88,2       | 88,6    | 86,2    | 84,8    | 83,9     |
| 27    | ,904                                 | ,974     | ,936   | ,897    | ,872    | ,926    | ,946     | 83,9                          | 87,0     | 90,0       | 89,0    | 86,4    | 85,4    | 84,9     |
| 28    | ,906                                 | ,970     | ,936   | ,888    | ,894    | ,978    | 30,004   | 84,5                          | 87,9     | 89,0       | 88,9    | 87,3    | 84,9    | 84,7     |
| 29    | ,950                                 | 30,000   | ,968   | ,918    | ,904    | ,968    | 29,992   | 84,0                          | 88,9     | 89,7       | 89,6    | 87,0    | 86,0    | 86,0     |
| 30    | ,956                                 | 29,996   | ,974   | ,914    | ,934    | ,966    | —        | 82,4                          | 85,2     | 87,9       | 88,1    | 86,0    | 85,2    | —        |
| Mean. | 29,923                               | 29,969   | 29,940 | 29,898  | 29,889  | 29,924  | 29,959   | 82,2                          | 85,0     | 86,9       | 87,3    | 85,1    | 83,9    | 84,0     |

## OBSERVATORY ; FOR THE MONTH OF SEPTEMBER 1834.

|      | Dep. of wet bulb Thermometer. |          |       |         |         |         |          | Rain. |       | Evaporation. | Wind.          | Remarks.                |
|------|-------------------------------|----------|-------|---------|---------|---------|----------|-------|-------|--------------|----------------|-------------------------|
|      | S. Rise.                      | 10 A. M. | Noon. | 2 P. M. | S. Set. | 8 P. M. | 10 P. M. | S. R. | S. S. |              |                |                         |
|      |                               |          |       |         |         |         |          |       |       |              |                |                         |
|      | °                             | °        | °     | °       | °       | °       | °        | Ins.  | Ins.  | Ins.         |                |                         |
| 1    | 3,0                           | 5,7      | 6,2   | 5,5     | 3,2     | 2,2     |          |       |       |              | SW. W. NW.     | } Cloudy and Lightning. |
| 2    | 2,9                           | 3,1      | ---   | 3,7     | 3,3     | 2,5     |          |       |       |              | W. NW. SW.     |                         |
| 3    | 2,6                           | 3,7      | 5,5   | 5,5     | ---     | 3,3     |          |       |       | 1,799        | W. NW. SW.     | } Mo. cl. t. l. & h. r. |
| 4    | 3,8                           | 6,0      | 7,2   | 8,5     | 3,5     | 3,6     |          |       |       |              | SW. NW. SW.    |                         |
| 5    | 2,8                           | 5,9      | 6,8   | 8,1     | 4,0     | 3,5     |          | 1,351 |       |              | SW. W.         | Do. do. sm. rn.         |
| 6    | 2,5                           | 3,8      | 5,1   | 5,0     | 2,3     | 2,1     |          |       |       |              | SW. W. SE. S.  | } Mo. cl. & Ltg.        |
| 7    | ---                           | 3,0      | 3,7   | 5,0     | 3,0     | 2,2     |          | 0,083 |       |              | W. NW. S.      |                         |
| 8    | 2,8                           | 1,8      | 3,8   | 3,9     | 2,7     | 2,4     |          |       | 0,021 |              | SW. W. E.      | } Do. do. s. r.         |
| 9    | 3,6                           | 3,7      | 7,2   | 7,0     | 2,8     | 1,3     |          |       |       |              | W. NW.         |                         |
| 10   | 3,7                           | 5,1      | 7,4   | 9,0     | 3,3     | 1,3     | 2,7      |       | 0,049 | 1,528        | W. NW. E. SE.  | Do. do. h. r.           |
| 11   | 3,6                           | 4,7      | 7,4   | 6,5     | 5,1     | 1,9     |          | 0,687 | 0,333 |              | W. SW. NW.     | Heavy Rain.             |
| 12   | 2,9                           | 3,9      | 6,1   | 5,4     | 2,5     | 1,7     |          | 1,479 |       |              | W. SW. & S.    | } M. cl. L. & Th.       |
| 13   | 1,0                           | 5,0      | 5,3   | 4,6     | 3,9     | 2,0     |          |       |       |              | W. NW. SW.     |                         |
| 14   | 2,3                           | 4,7      | 6,4   | 6,5     | 4,4     | 3,4     |          | 0,271 |       |              | SW. W.         | } Do. do. Rain.         |
| 15   | 3,2                           | ---      | 8,0   | 7,4     | 4,3     | 3,1     |          | 0,424 |       |              | W. NW. S.      |                         |
| 16   | 2,6                           | 6,9      | 7,5   | 5,5     | 4,9     | 3,2     |          | 0,167 |       |              | W. NW.         | } Do. do. Thunr.        |
| 17   | 4,2                           | 6,9      | 7,4   | 7,6     | 5,4     | 4,1     | 4,0      |       |       | 1,944        | NW. S. SE.     |                         |
| 18   | 4,2                           | 6,9      | 8,5   | 4,8     | 3,7     | 2,7     |          |       |       |              | SW. W. SE. S.  | } Do. do. Thunr.        |
| 19   | 3,5                           | 4,5      | 4,6   | 5,0     | 3,1     | 3,0     | 2,8      |       |       |              | W. SW. S. SE.  |                         |
| 20   | 2,2                           | 5,7      | 5,5   | 5,3     | 4,2     | 3,5     | 2,7      |       |       |              | SW. SE.        |                         |
| 21   | 2,3                           | 5,0      | 6,0   | 6,9     | 5,1     | 3,8     | 3,7      |       |       |              | W. E. SE.      | } Mo. cl. & Ltg.        |
| 22   | 3,0                           | 5,7      | 8,0   | 8,7     | 4,5     | 3,0     | 2,0      |       |       |              | W. SW. NW. N.  |                         |
| 23   | 2,4                           | 5,1      | 7,8   | 4,9     | 5,4     | 4,1     | 3,7      |       |       |              | SW. W. NW. SE. | } Do. cl. & Ltg.        |
| 24   | 2,6                           | 7,5      | 7,5   | 7,0     | 4,4     | 4,0     | 3,3      |       |       |              | W. SW. S. SE.  |                         |
| 25   | 2,5                           | 5,2      | 4,9   | 4,3     | 4,4     | 3,1     | 2,6      |       |       |              | SE. S. SW.     |                         |
| 26   | 2,5                           | 6,5      | 5,9   | 5,7     | 4,2     | 3,2     | 2,3      |       |       |              | W. S. SE.      | } Do. do. Thunr.        |
| 27   | 2,9                           | 5,2      | 9,0   | 5,0     | 4,4     | 3,5     | 2,9      |       |       |              | SW. W. NW. SE. |                         |
| 28   | 2,5                           | 5,7      | 5,4   | 5,4     | 5,0     | 3,2     | 2,7      |       |       |              | SE. S. SW.     | } Mo. cl. Ltg. & Sh.    |
| 29   | 4,1                           | 8,0      | 6,5   | 5,6     | 4,9     | 3,1     | 3,2      |       |       |              | N. E. NE.      |                         |
| 30   | 4,1                           | 4,2      | 5,9   | 4,5     | 4,0     | 4,2     |          |       |       |              | W. E. N.       |                         |
| Mean | 3,0                           | 5,1      | 6,4   | 5,9     | 4,0     | 2,9     | 3,0      |       |       |              |                |                         |

## METEOROLOGICAL REGISTER KEPT AT THE MADRAS

|       | Standard Barometer No 3. by Gilbert. |          |        |         |         |         |          | Standard Therm. by Troughton. |          |            |         |          |         |          |
|-------|--------------------------------------|----------|--------|---------|---------|---------|----------|-------------------------------|----------|------------|---------|----------|---------|----------|
|       | Sun Rise                             | 10 A. M. | Noon.  | 2 P. M. | 4 P. M. | 6 P. M. | 10 P. M. | Sun Rise.                     | 10 A. M. | Aft. Noon. | 2 P. M. | Sun Set. | 8 P. M. | 10 P. M. |
| Octr. | Ins.                                 | Ins.     | Ins.   | Ins.    | Ins.    | Ins.    | Ins.     | o                             | o        | o          | o       | o        | o       | o        |
| 1     | 29,928                               | 29,986   | 29,946 | 29,910  | 29,920  | 29,936  | 29,952   | 82,8                          | 83,0     | 84,0       | 86,6    | 84,1     | 82,3    | 82,3     |
| 2     | ,012                                 | ,938     | ,908   | ,844    | ,852    | ,868    | —        | 82,6                          | 82,5     | 84,0       | 84,4    | 82,3     | 81,6    | —        |
| 3     | ,876                                 | ,869     | ,870   | ,826    | ,834    | ,862    | —        | 79,5                          | 78,0     | 79,7       | 81,8    | 80,0     | 79,7    | —        |
| 4     | ,874                                 | ,930     | ,898   | ,856    | ,860    | ,894    | ,924     | 80,0                          | 81,9     | 82,9       | 82,8    | 81,9     | 81,8    | 80,3     |
| 5     | ,894                                 | ,942     | ,910   | —       | ,850    | ,888    | ,898     | 80,9                          | 84,7     | 87,3       | —       | 83,0     | 83,0    | 82,9     |
| 6     | ,861                                 | ,902     | ,866   | ,830    | ,832    | ,874    | ,888     | 80,5                          | 84,5     | 85,8       | 85,7    | 83,5     | 83,0    | 82,6     |
| 7     | ,882                                 | ,924     | ,900   | ,850    | ,864    | ,894    | ,920     | 81,4                          | 85,5     | 88,6       | 87,4    | 84,9     | 83,8    | 83,7     |
| 8     | ,918                                 | —        | ,924   | ,878    | ,900    | ,924    | —        | 79,0                          | —        | 87,1       | 88,6    | 78,3     | 81,5    | —        |
| 9     | ,890                                 | ,962     | ,932   | ,902    | ,902    | ,940    | —        | 81,6                          | 83,0     | 86,0       | 88,0    | 83,2     | 83,2    | —        |
| 10    | ,930                                 | 30,006   | ,952   | ,928    | ,928    | ,976    | —        | 82,0                          | 80,1     | 82,0       | 86,0    | 83,8     | 81,8    | —        |
| 11    | ,968                                 | ,026     | ,998   | ,960    | ,926    | ,964    | —        | 81,2                          | 80,9     | 82,0       | 82,4    | 81,6     | 81,0    | —        |
| 12    | ,936                                 | 29,968   | ,924   | ,872    | ,872    | ,910    | —        | 81,0                          | 83,0     | 85,6       | 87,0    | 83,9     | 83,0    | —        |
| 13    | ,876                                 | ,954     | ,918   | ,860    | ,878    | ,910    | —        | 81,4                          | 80,0     | 78,0       | 78,5    | 77,2     | 77,0    | —        |
| 14    | ,908                                 | ,991     | ,950   | ,886    | ,912    | ,958    | —        | 78,8                          | 82,9     | 81,0       | 83,9    | 81,9     | 81,9    | —        |
| 15    | ,940                                 | ,984     | ,960   | ,908    | ,884    | ,926    | —        | 78,7                          | 83,2     | 81,0       | 82,6    | 79,0     | 80,0    | —        |
| 16    | ,898                                 | ,952     | ,914   | ,868    | ,854    | ,912    | ,918     | 79,0                          | 83,7     | 85,0       | 86,8    | 84,2     | 83,0    | 82,6     |
| 17    | ,876                                 | ,924     | ,900   | ,850    | ,856    | ,908    | —        | 79,8                          | 84,3     | 86,4       | 85,9    | 83,8     | 83,4    | —        |
| 18    | ,928                                 | 30,008   | ,968   | ,912    | ,930    | ,984    | 30,010   | 80,9                          | 83,9     | 86,0       | 86,8    | 85,0     | 84,0    | 83,2     |
| 19    | ,996                                 | ,058     | 30,028 | ,984    | ,930    | 30,022  | ,132     | 80,9                          | 84,7     | 86,4       | 88,8    | 86,2     | 84,5    | 83,5     |
| 20    | 30,016                               | ,056     | ,008   | ,940    | ,958    | ,012    | ,018     | 82,0                          | 86,1     | 88,0       | 80,0    | 87,0     | 84,0    | 82,0     |
| 21    | 29,986                               | ,022     | 29,973 | —       | ,938    | 29,972  | 29,980   | 82,5                          | 86,0     | 87,5       | —       | 84,2     | 81,5    | 80,7     |
| 22    | ,978                                 | ,032     | ,996   | ,944    | ,946    | ,976    | ,076     | 79,7                          | 84,0     | 86,0       | 87,0    | 83,2     | 82,8    | 80,4     |
| 23    | ,980                                 | ,020     | ,984   | ,944    | ,950    | ,970    | ,988     | 80,1                          | 84,0     | 87,0       | 88,6    | 84,7     | 82,8    | 81,7     |
| 24    | ,994                                 | ,032     | ,968   | ,946    | ,952    | ,990    | 30,008   | 80,7                          | 85,3     | 87,4       | 88,0    | 84,7     | 83,9    | 85,0     |
| 25    | 30,012                               | ,046     | ,994   | ,940    | ,942    | ,976    | 29,988   | 81,8                          | 86,0     | 87,7       | 88,4    | 83,7     | 82,2    | 80,6     |
| 26    | 29,986                               | ,032     | ,978   | ,936    | ,914    | ,980    | 30,008   | 79,0                          | 83,4     | 85,8       | 88,0    | 82,6     | 81,1    | 80,2     |
| 27    | ,994                                 | ,056     | 30,018 | ,982    | ,984    | 30,026  | ,054     | 77,3                          | 83,6     | 85,0       | 87,5    | 83,7     | 80,0    | 80,8     |
| 28    | 30,042                               | ,092     | ,054   | 30,002  | ,996    | ,042    | ,066     | 80,0                          | 85,6     | 87,0       | 88,0    | 81,3     | 83,7    | 81,3     |
| 29    | ,058                                 | ,099     | ,050   | 29,992  | ,978    | ,022    | ,30      | 81,6                          | 85,6     | 87,6       | 87,0    | 84,2     | 83,1    | 82,1     |
| 30    | ,053                                 | ,080     | ,042   | ,986    | 30,000  | ,052    | ,060     | 81,3                          | 86,1     | 87,0       | 87,0    | 84,0     | 83,3    | 83,7     |
| 31    | ,048                                 | ,092     | ,036   | 30,002  | ,032    | ,072    | —        | 78,2                          | 80,3     | 83,8       | 84,2    | 82,9     | 81,8    | —        |
| Mean  | 29,950                               | 30,000   | 29,961 | 29,915  | 29,918  | 29,936  | 29,985   | 80,0                          | 83,2     | 85,3       | 85,9    | 83,2     | 82,2    | 82,      |

## OBSERVATORY; FOR THE MONTH OF OCTOBER 1884.

| Dep. of wet bulb Thermometer. |          |         |         |         |         |          |       | Rain. |       | Evaporation. | Wind.            | Remarks.                |
|-------------------------------|----------|---------|---------|---------|---------|----------|-------|-------|-------|--------------|------------------|-------------------------|
| S. Rise.                      | 10 A. M. | Aft. N. | 2 P. M. | S. Set. | 8 P. M. | 10 P. M. | S. R. | S. S. |       |              |                  |                         |
| °                             | °        | °       | °       | °       | °       | °        | Ins.  | Ins.  | Ins.  |              |                  |                         |
| 1                             | 2,8      | 5,1     | 4,8     | 4,6     | 4,0     | 2,5      | 2,3   |       |       | 2,667        | N. NE. E.        | Cl. da. ltg. & shr.     |
| 2                             | 3,0      | 3,0     | 6,0     | 5,5     | 4,5     | 2,4      |       |       |       |              | N. W. NW. N.     | Cl. da. rain:           |
| 3                             | 1,7      | 0,0     | 1,7     | 1,8     | 1,1     | 0,6      |       | 0,278 | 0,500 |              | N. NW. N.        |                         |
| 4                             | 2,0      | 2,8     | 3,2     | 2,3     | 1,4     | 1,8      | 1,2   | 0,063 |       |              | SW. W. NW. NE.   | Do. do. some rn.        |
| 5                             | 1,2      | 3,8     | 6,9     | —       | 3,6     | 2,8      | 2,9   |       |       |              | W. SW. S. E. SE. | Do. Lightg.             |
| 6                             | 3,5      | 4,5     | 5,1     | 5,7     | 3,7     | 3,0      | 2,6   |       |       |              | S. W. SE. S.     |                         |
| 7                             | 1,4      | 3,5     | 6,6     | 3,4     | 3,1     | 2,0      | 2,0   |       |       |              | S. SW. SE. E.    | Mo. clr. d. &           |
| 8                             | 3,0      | —       | 6,6     | 5,1     | 2,3     | 1,5      |       | 1,069 |       | 1,514        | N. W. N. W. SE   | cl. n. h. r. th. lt.    |
| 9                             | 1,7      | 3,2     | 5,2     | 6,5     | 2,4     | 2,6      |       | 1,125 | 0,021 |              | W. N. W. SW. NE  |                         |
| 10                            | 2,0      | 2,1     | 2,5     | 6,5     | 4,3     | 3,3      |       |       | 0,027 |              | W. NW. NE. E.    | Mostly clr da:<br>Rain. |
| 11                            | 2,2      | 2,9     | 2,3     | 4,8     | 1,8     | 1,3      |       |       |       |              | N. NE. NW. E     |                         |
| 12                            | 1,5      | 3,0     | 5,9     | 8,6     | 3,9     | 2,2      |       |       |       |              | SW. W. NW. W.    | Cl. da. ltg. & thr.     |
| 13                            | 0,6      | 1,7     | 0,0     | 0,5     | 0,2     | 0,0      |       | 0,104 | 1,528 |              | N. W. N. W.      | Cl. da. hy. rn.         |
| 14                            | 0,9      | 2,7     | 4,0     | 3,5     | 1,9     | 0,7      |       |       |       |              | NW. N. NE. N.    |                         |
| 15                            | 0,9      | 3,3     | 3,4     | 1,4     | 1,0     | 0,2      |       | 0,486 | 0,118 | 0,961        | N. E. SE. S.     | Do. do. rain.           |
| 16                            | 1,0      | 3,7     | 5,0     | 5,3     | 3,2     | 3,0      | 2,3   | 0,187 |       |              | SW. W. SE. S.    |                         |
| 17                            | 2,0      | 4,4     | 6,4     | 5,9     | 3,8     | 2,4      |       |       |       |              | W. SW. SE. S.    | Cl. da. Ltg:            |
| 18                            | 4,9      | 6,1     | 8,0     | 7,9     | 5,0     | 4,4      | 3,6   |       |       |              | SW. W. SE.       |                         |
| 19                            | 2,7      | 4,2     | 8,4     | 9,8     | 4,2     | 2,6      | 3,3   |       |       |              | SW. E.           |                         |
| 20                            | 2,0      | 5,1     | 10,0    | 3,0     | 5,0     | 3,2      | 2,0   |       |       |              | NW. W.           |                         |
| 21                            | 2,7      | 5,8     | 9,2     | —       | 5,2     | 3,7      | 2,7   |       |       |              | NW. N. NE        |                         |
| 22                            | 1,9      | 6,0     | 11,0    | 11,4    | 9,2     | 7,0      | 4,8   |       |       | 1,035        | NW. N. SE.       | Mostly clear.           |
| 23                            | 3,7      | 6,2     | 12,8    | 11,8    | 5,5     | 4,8      | 3,4   |       |       |              | NW. SW. S. E. S. |                         |
| 24                            | 1,7      | 7,5     | 9,0     | 13,4    | 4,7     | 4,1      | 4,0   |       |       |              | W. NW. SE.       |                         |
| 25                            | 2,1      | 8,1     | 13,7    | 15,4    | 5,5     | 3,2      | 2,2   |       |       |              | N. NE. NW.       |                         |
| 26                            | 1,5      | 8,8     | 10,3    | 10,5    | 4,2     | 2,3      | 1,4   |       |       |              | NW. N. NE. E.    | Mo. clr. Ltg.           |
| 27                            | 2,8      | 11,1    | 11,0    | 13,5    | 5,7     | 2,6      | 2,8   |       |       |              | N. NW. E. SW.    |                         |
| 28                            | 2,2      | 7,1     | 9,0     | 6,8     | 4,8     | 3,8      | 2,8   |       |       |              | SW. S. W. E.     |                         |
| 29                            | 3,6      | 5,7     | 7,6     | 6,0     | 4,6     | 3,1      | 2,1   |       |       | 2,500        | NW. SE. SW.      | [Th. Ltg. hy. r.        |
| 30                            | 2,3      | 5,8     | 5,0     | 6,3     | 3,5     | 3,1      | 3,3   |       |       |              | SW. SE. S.       | Mo. clr. d. cl. at n.   |
| 31                            | 1,2      | 1,3     | 3,8     | 2,6     | 2,9     | 1,9      |       | 1,132 | 0,377 |              | NW. W. SW.       | Mo. cl. some rain.      |
| ann                           | 2,2      | 4,6     | 6,6     | 6,5     | 3,7     | 2,6      | 2,7   |       |       |              |                  |                         |

## METEOROLOGICAL REGISTER KEPT AT THE MADRAS

| Novr. | Standard Barometer No. 3 by Gilbert. |          |        |         |         |         |          | Standard Therm. by Troughton. |          |       |         |         |         |          |
|-------|--------------------------------------|----------|--------|---------|---------|---------|----------|-------------------------------|----------|-------|---------|---------|---------|----------|
|       | Sun Rise.                            | 10 A. M. | Noon.  | 2 P. M. | 4 P. M. | 6 P. M. | 10 P. M. | S. Rise.                      | 10 A. M. | Noon. | 2 P. M. | S. Set. | 8 P. M. | 10 P. M. |
|       | Ins.                                 | Ins.     | Ins.   | Ins.    | Ins.    | Ins.    | Ins.     | °                             | °        | °     | °       | °       | °       | °        |
| 1     | 30,080                               | 30,132   | 30,084 | 30,012  | 30,052  | 30,094  | 30,108   | 81,0                          | 81,2     | 80,0  | 81,5    | 81,7    | 81,2    | 80,4     |
| 2     | ,162                                 | ,152     | ,102   | ,070    | ,094    | ,140    | ,150     | 79,7                          | 82,5     | 83,7  | 83,7    | 81,9    | 81,7    | 80,3     |
| 3     | ,138                                 | ,199     | ,153   | ,094    | ,134    | ,182    | —        | 79,0                          | 82,2     | 81,7  | 78,0    | 80,9    | 80,8    | —        |
| 4     | ,120                                 | ,160     | ,100   | ,050    | ,082    | ,130    | ,133     | 77,2                          | 81,7     | 82,0  | 83,0    | 80,3    | 79,2    | 77,0     |
| 5     | ,078                                 | ,130     | ,088   | ,030    | ,038    | ,080    | ,080     | 74,7                          | 79,0     | 80,9  | 82,2    | 80,0    | 77,2    | 75,1     |
| 6     | ,070                                 | ,122     | ,086   | ,034    | ,034    | ,074    | ,080     | 74,6                          | 82,0     | 81,8  | 83,6    | 80,8    | 77,9    | 75,2     |
| 7     | ,084                                 | ,152     | ,120   | ,084    | ,082    | ,122    | ,140     | 72,8                          | 81,4     | 83,0  | 83,8    | 80,2    | 78,4    | 76,0     |
| 8     | ,092                                 | ,162     | ,124   | ,080    | ,070    | ,116    | ,134     | 73,9                          | 81,3     | 82,9  | 82,7    | 80,0    | 78,2    | 77,2     |
| 9     | ,104                                 | ,170     | ,110   | ,072    | ,086    | ,116    | ,114     | 75,3                          | 81,0     | 83,0  | 82,5    | 80,4    | 78,0    | 77,7     |
| 10    | ,088                                 | ,170     | ,12    | ,058    | ,078    | ,126    | ,128     | 74,0                          | 79,0     | 81,0  | 82,0    | 79,7    | 79,5    | 75,0     |
| 11    | ,082                                 | ,140     | ,092   | ,056    | ,086    | ,130    | —        | 74,7                          | 80,3     | 80,0  | 80,8    | 78,5    | 77,5    | —        |
| 12    | ,115                                 | ,178     | ,146   | ,098    | ,110    | ,152    | ,160     | 74,9                          | 79,6     | 80,0  | 81,3    | 79,7    | 78,7    | 77,7     |
| 13    | ,130                                 | ,220     | ,192   | ,100    | ,116    | ,164    | ,172     | 72,4                          | 80,1     | 81,8  | 81,0    | 79,2    | 77,9    | 78,0     |
| 14    | ,149                                 | ,222     | ,188   | ,120    | ,106    | ,148    | ,158     | 72,8                          | 79,2     | 80,1  | 80,5    | 79,3    | 78,8    | 77,5     |
| 15    | ,142                                 | ,226     | ,202   | ,126    | ,130    | ,176    | ,186     | 73,8                          | 79,8     | 81,0  | 81,8    | 79,3    | 78,4    | 78,0     |
| 16    | ,152                                 | ,226     | ,204   | ,138    | ,132    | ,184    | ,190     | 75,0                          | 80,2     | 81,5  | 81,8    | 79,6    | 79,2    | 78,7     |
| 17    | ,138                                 | ,212     | ,184   | ,114    | ,102    | ,180    | ,146     | 75,5                          | 81,3     | 82,3  | 83,0    | 80,0    | 80,0    | 79,3     |
| 18    | ,100                                 | ,170     | ,154   | ,086    | ,108    | ,156    | —        | 73,5                          | 80,3     | 81,4  | 82,6    | 79,0    | 78,5    | —        |
| 19    | ,116                                 | ,172     | ,136   | ,100    | ,122    | ,170    | —        | 75,8                          | 77,4     | 78,0  | 77,6    | 78,7    | 79,0    | —        |
| 20    | ,102                                 | ,152     | ,122   | ,086    | ,090    | ,142    | ,156     | 76,9                          | 80,9     | 82,2  | 81,7    | 79,5    | 79,2    | 78,7     |
| 21    | ,112                                 | ,140     | ,108   | ,072    | ,088    | ,144    | —        | 78,8                          | 80,8     | 80,8  | 80,7    | 78,8    | 78,8    | —        |
| 22    | ,094                                 | ,140     | ,090   | ,050    | ,058    | ,098    | —        | 78,2                          | 80,7     | 81,0  | 80,8    | 79,1    | 78,0    | —        |
| 23    | ,036                                 | ,082     | ,040   | 29,996  | ,028    | ,060    | —        | 78,3                          | 80,4     | 81,5  | 80,2    | 79,0    | 77,3    | —        |
| 24    | ,014                                 | ,064     | ,022   | ,996    | ,002    | ,014    | —        | 76,0                          | 77,4     | 78,9  | 78,0    | 78,3    | 77,0    | —        |
| 25    | ,036                                 | ,098     | ,060   | 30,014  | ,022    | ,102    | —        | 77,0                          | 78,8     | 79,8  | 79,7    | 78,3    | 78,0    | —        |
| 26    | ,076                                 | ,150     | ,010   | ,038    | ,050    | ,164    | —        | 76,8                          | 80,0     | 80,0  | 80,8    | 78,7    | 78,4    | —        |
| 27    | ,076                                 | ,128     | ,090   | ,030    | ,042    | ,102    | 30,100   | 76,9                          | 78,3     | 79,4  | 80,0    | 77,9    | 76,8    | 75,7     |
| 28    | ,050                                 | ,120     | ,060   | ,022    | ,022    | ,084    | ,100     | 71,6                          | 78,2     | 77,6  | 78,9    | 76,3    | 75,7    | 75,0     |
| 29    | ,058                                 | ,132     | ,096   | ,050    | ,056    | ,098    | —        | 71,5                          | 77,5     | 78,7  | 79,0    | 77,3    | 76,9    | —        |
| 30    | ,076                                 | ,124     | ,098   | ,044    | ,062    | ,140    | —        | 74,2                          | 77,0     | 78,0  | 79,4    | 77,4    | 77,0    | —        |
| Mean  | 30,093                               | 30,155   | 30,113 | 30,066  | 30,076  | 30,124  | 30,125   | 75,5                          | 80,0     | 80,4  | 81,1    | 79,3    | 71,4    | 70,7     |

## OBSERVATORY; FOR THE MONTH OF NOVEMBER 1834.

| Dep. of wet bulb Thermometer. |          |         |         |         |         |          |       | Rain. |       | Evaporation. | Wind.         | Remarks.                               |
|-------------------------------|----------|---------|---------|---------|---------|----------|-------|-------|-------|--------------|---------------|--|
| S. Rise                       | 10 A. M. | Aft. N. | 2 P. M. | S. Set. | 8 P. M. | 10 P. M. | S. R. | S. S. |       |              |               |  |
| 0                             | 0        | 0       | 0       | 0       | 0       | 0        | Ins.  | Ins.  | Ins.  |              |               | [& Ltg.                                |
| 1                             | 1,2      | 2,2     | 2,0     | 1,5     | 1,7     | 1,2      | 0,9   |       | 0,639 |              | SW. W. NW.    | Mo. Clo. Rn. Th.                       |
| 2                             | 1,5      | 3,3     | 3,9     | 2,7     | 2,6     |          | 0,8   |       |       |              | SW. N. NW.    | Do. do.                                |
| 3                             | 0,7      | 2,2     | 2,2     | 2,0     | 1,1     | 3,0      |       | 0,451 | 0,125 |              | NW. N. SW.    | Lightning.                             |
| 4                             | 1,2      | 6,3     | 4,0     | 5,0     | 5,5     | 5,2      | 3,0   |       |       |              | N. NW. NE. E. |  |
| 5                             | 1,7      | 3,0     | 6,3     | 6,7     | 4,0     | 2,2      | 1,1   |       |       | 1,771        | N. NW. NE.    |  |
| 6                             | 0,6      | 10,0    | 8,3     | 8,6     | 7,8     | 4,9      | 3,2   |       |       |              | N. NE.        | Mo. Clr. Dw.                           |
| 7                             | 2,6      | 9,4     | 10,6    | 9,3     | 6,0     | 4,4      | 3,0   |       |       |              | N. NE.        |  |
| 8                             | 2,1      | 9,5     | 9,6     | 9,9     | 6,5     | 5,2      | 3,2   |       |       |              | N. NE.        |  |
| 9                             | 2,3      | 7,0     | 10,0    | 6,5     | 6,4     | 4,5      | 3,5   |       |       |              | N. NE.        |  |
| 10                            | 2,2      | 4,5     | 6,9     | 7,5     | 6,2     | 3,5      | 0,8   |       |       |              | N. NE.        | Mo. Cl. some Rain, Clr. night and Dew. |
| 11                            | 2,7      | 4,3     | 5,2     | 4,6     | 2,7     | 1,8      | ---   |       |       |              | N. NE.        |  |
| 12                            | 1,9      | 3,8     | 4,0     | 7,3     | 5,7     | 1,9      | 4,2   | 0,097 |       | 2,598        | N. NE.        | Mo. Clr. and Dew.                      |
| 13                            | 2,1      | 5,8     | 7,8     | 5,6     | 7,2     | 5,7      | 5,0   |       |       |              | N. NE.        |  |
| 14                            | 2,8      | 5,3     | 6,1     | 5,3     | 5,5     | 5,2      | 4,3   |       |       |              | N. NE.        |  |
| 15                            | 2,8      | 5,5     | 7,0     | 7,8     | 6,3     | 4,5      | 4,6   |       |       |              | N. NE. E.     |  |
| 16                            | 1,8      | 5,9     | 7,5     | 7,8     | 6,8     | 6,2      | 6,6   |       |       |              | N. E.         | Cloudy at night.                       |
| 17                            | 3,3      | 7,0     | 8,3     | 7,8     | 6,2     | 5,8      | 5,7   |       |       |              | N. NE. E.     |  |
| 18                            | 3,0      | 6,4     | 4,8     | 5,4     | 3,1     | 2,0      |       |       |       |              | E. NE.        | Do. do. [nt.                           |
| 19                            | 1,8      | 1,4     | 1,6     | 1,6     | 3,7     | 4,0      |       | 0,333 | 0,146 | 2,681        | E. NE. N.     | Mo. cl. & sm. r. at                    |
| 20                            | 2,9      | 5,3     | 5,2     | 5,1     | 4,5     | 3,4      | 4,7   |       |       |              | N. NE. E.     | Mo. cl. & some rn.                     |
| 21                            | 2,8      | 4,6     | 4,0     | 3,7     | 1,6     | 1,8      | ---   |       | 0,049 |              | NE. N. E.     | Cl. & Hvy. rn. Th. Lightning.          |
| 22                            | 1,7      | 2,7     | 1,6     | 1,8     | 1,4     | 1,0      |       | 0,361 | 0,215 |              | NE. N. E.     |  |
| 23                            | 0,8      | 0,9     | 1,5     | 1,4     | 2,0     | 1,3      |       | 1,424 | 2,451 |              | E. NE. S.     | Clo. day and drizzling Rain.           |
| 24                            | 0,1      | 0,2     | 1,3     | 0,6     | 0,8     | 0,5      |       | 0,486 | 0,306 |              | N. NE.        |  |
| 25                            | 0,8      | 0,6     | 1,0     | 1,7     | 1,1     | 0,8      |       | 0,714 | 0,014 |              | E. SE.        | Cl. da. Clr. night.                    |
| 26                            | 0,8      | 2,0     | 1,4     | 1,8     | 2,7     | 2,4      |       |       | 0,041 | 1,299        | E. NE.        |  |
| 27                            | 2,9      | 3,5     | 5,4     | 5,0     | 4,9     | 3,3      | 3,2   |       |       |              | N. E. NE.     | Mostly clear.                          |
| 28                            | 1,1      | 6,2     | 4,6     | 6,7     | 5,8     | 5,7      | 5,0   |       |       |              | N. NE.        | Mo. cl. & sm. rn.                      |
| 29                            | 1,5      | 5,1     | 4,7     | 4,5     | 3,5     | 3,1      | ---   |       |       |              | N. NE.        | Do. do.                                |
| 30                            | 1,6      | 2,0     | 2,8     | 3,6     | 3,4     | 1,4      |       | 0,111 |       |              | N. NE.        |  |
| Mean                          | 1,8      | 4,5     | 5,0     | 5,0     | 4,2     | 3,3      | 2,5   |       |       |              |               |  |



The instruments with which the foregoing observations have been made, are placed upon a table about 4 feet above the ground in the western verandah of the Honourable Company's Observatory ; which is situated in Longitude  $5\text{h. } 21' 9'' \text{ E}$  : Latitude  $13^{\circ} 4' 9'' \text{ N}$  ; at about two miles from the Sea and about 27 feet above the low water mark.

T. G. TAYLOR,  
*H. C. Astronomer.*

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SKETCH OF THE LIFE OF THE RAMOOSSY CHIEF  
OOMIAH NAIK, KHOMNEY OF POORUNDUR.

*Continued from Number 6.*

*I.—A Sketch of the History of the Ramoossies residing in the Sattarah Territory and in the Poona and Ahmednuggur districts—By Captain Alexander Mackintosh of the 27th Regt. M. N. I. Commanding Ahmednuggur Local Corps.*

### CHAPTER XIII.

Oomiah begins to claim rights in the Punt Suchew's country.—He has an interview with the Rajah of Satara; proposes that the Rajah should decide the matter by throwing the Punt and himself into the Neera river.—He asks the Rajah to employ him.—The collector is directed by Government to inform Oomiah to continue quiet, and to submit his claims to Government.—Mr. Giberne reports to Government the difficulty of managing Oomiah.—The copper-plate deeds, and old grants.—Oomiah's pretended discontent.—States that he has little or no property.—His ambitious sentiments.—He employs the Kykaries to plunder at Arabah.—The Ramoossies plunder the Patell of Dhurumpoor.—The collector sends a Karkoon to reside at Sakoorde.—The Koukurny of Ekutpoor plundered, and the collector interferes.—Two parties are dispatched from Sakoorde to plunder in opposite directions.—A Brahmin at Wurgawn killed.—The Kykaries commit several robberies.—The Ramoossies plunder a house at Allundy, and commit several robberies in Phultundesh.

It becomes necessary to state here, that Oomiah had latterly began to revive his claims against the Punt Suchew. He, in his usual summary manner sent some sepoy to attack the revenue of the village of the Kheirbary, belonging to the Punt, and from which the Ramoossies asserted they were entitled to receive certain ducs. I shall allude more fully to this transaction hereafter, and mention it at present, partly on account of explaining the nature of Oomiah's interview with the Rajah of Satara when he visited Bholee on the banks of the Neera, a few koss south of Poorundur.

Some of Oomiah's people had been lately engaged in a plundering excursion in the Satara country, and upon his

preparing to visit the Rajah, he thought it advisable to put forth exaggerated statements of the number of his followers, in the expectation that the Rajah might be impressed with a greater idea of his importance and power, and that His Highness's bearing to him, would be of a corresponding nature. On the 18th of February 1830, he presented himself before His Highness who was attended by all his Jageerdars, as well as by a number of Mankuries.

The Rajah alluded to the disturbances caused by the Ramoossies in the Satara territory, and observed that they made use of his (Oomiah's) name. Oomiah said that he hoped His Highness would punish such persons in a most exemplary manner when they were apprehended.

With the Rajah's permission Oomiah now submitted some old sunnuds in his possession to the Punt Suchew, stating at the same time, "that if these papers establish any claims to certain rights and dues in your country, I hope you will let me enjoy them—if not I shall be ruined;" adding that, "you had better at once tie me in a mouth (the leather bag used in raising up water from wells when irrigating fields) and throw me into the Neera river." The Rajah observed, that if his claims could be established in the Punt's country, they would be restored to him; and that if he would come to Satara, any rights which he might have in that territory, should also be restored to him. Oomiah still addressing himself to the Punt, said, "I am not afraid of you, His Highness is present, so do not attempt to depress me, nor deprive me of my rights." The Rajah told the Punt Suchew to inquire into the claims, and he was directed to bring his papers to Satara. Oomiah communicated this to me, but I have been informed, that he suggested to the Rajah, that he should tie the Punt Suchew in one mouth, and himself in another, and then that His Highness should order both mouths to be thrown into the river, by which means he would have an opportunity of seeing which had justice on his side.

The Rajah of Satara mentioned to me lately, that Oomiah had been trying to obtain employment from him, and that he wished to have charge of the district south of the Neera river. That he had desired Oomiah to go to

Satara, that the claims against the Punt Suchew might be investigated, but that he would not venture to go there. About a month after this, one of Oomiah's followers, and a great friend of his who had been plundering in the Satara territory, was apprehended and executed by the Rajah's orders.

In the month of January, the collector had directed Oomiah to withdraw the sepoys he sent into the Punt Suchew's villages, which he accordingly did. Orders were subsequently received by Mr. Giberne from Government, directing him to inform Oomiah, that he ought to remember the kindness and mercy that had been shown towards him, and that he should conduct himself in a more becoming manner, and await the decision of Government; and to order the Naik to produce all the papers and documents which he had in possession, that a full and fair investigation of the rights which he claimed might be made.

When the collector was in the Poorundur district on revenue duty, Oomiah and his brother waited on him, and laid before him twenty-four papers, on which they appeared to place high value, as establishing their claims to many rights and privileges as the owners of Poorundur fort. These documents were grants, orders, and letters, given to the Kolies, Mhars, and Ramoossies of the fort of Poorundur by former princes of the country, by Governors and Mamultdars. Mr. Giberne made an abstract translation of these papers, and transmitted a long and full report on the subject to Government on the 30th April, 1830.

Mr. Giberne in his report, alludes to the circumstance of any Rajah or Government granting to such persons lands and other rights for service, with the reservation of right of withholding, or resuming such grants on the failure of service, or in committing acts against the welfare of the state; he remarks also, with what affection and reverence these people look upon such old torn papers, which they consider to confer a right withheld, and that they are fully impressed with the idea of their being unjustly deprived of their wuttuns. He thinks no threats will prevent them from availing themselves of the first opportunity to obtain their rights, and that by hints they have

vaguely thrown out, that they mean to claim the bukshish granted by the Padshaw.

He further remarks, that if the claims should be investigated in a regular court, they would fall to the ground as unsubstantiated by ~~e~~oyment for so many years; and consequently that it is a question which requires great consideration; for it is apprehended that the Koley and Mhar Naiks might set up claims, and that unless Oomiah's demands are complied with, he will be induced to offer resistance to Government. His power and capabilities in this respect are explained, his having maintained a protracted struggle during the first disturbance, and at length obtained terms from the Government.

I shall endeavour to give a close translation of the paper said to be a copy of the tambur putturs, (the copper-plate deeds,) and it will be found in the Appendix; but how Oomiah contrived to have a copy taken of it, I know not. A Brahmun to whom I have shewn it (the copy) expressed great surprise, and immediately observed, that it could be merely the traditionary tale of what was supposed to be engraved on the copper-plates, and not a copy of the original deed. This Brahmun, who is an intelligent man, further told me, that Captain H. D. Robertson, the collector of Poona, put the ~~c~~opper-plates in his hands, and directed him to endeavour to discover the nature of the grant; but that although he kept it for three months, all he could discover was that, it purported that he had shaken off his allegiance to the Emperor, and established an independent kingdom in the Dekhan, making Kulburga his capital, and after the dismemberment of this extensive state, his descendants, about A. D. 1528, established themselves at Beder, retaining possession of the surrounding districts.

It might also be remarked, that the Mhars of Poorundur (Bhyre Naak, &c. &c.) are clearly entitled to share in the grant bestowed by this King, (whoever he might have been,) according to the tenor of the first terms of the grant; but when the copper-plate deeds are to be prepared, they are entirely excluded, whilst no allusion whatever is made to the Ramoossies in them.

The document on which Oomiah pretended to found his claims to the Mookassa rights of the Kheirbary, (thirteen villages belonging to the Punt Suchew,) was granted by one Dewan Ally to the Koley Naiks of Poorundur, and no mention whatever is made of the Ramoossies in the paper. This grant was written about one hundred and four years ago, and they do not appear to have enjoyed it above seventy or eighty years; for about that time the chief Koley Naik, named Chandjee, was discovered to be concerting some schemes for delivering up some of the forts to the Mahomedan authorities that had been previously displaced; and on account of his intended treachery, Chandjee was seized and executed, and his head was sent round to the different hill forts to be exhibited to the troops forming the different garrisons, as a warning to them not to forget their duty. This took place about one hundred and twenty-seven years ago. The Punt Suchew resumed the Mookassa of the Kheirbary at the time, and no Koley has enjoyed it since then.

Although Oomiah (supported by his brothers and a few others) had been so persevering in trying to recover these Mookassa dues, many Ramoossies, and the inhabitants of the district, were well aware that his putting forth such claims was absurd; for they were never founded on any principles of justice or of right.

There could not be a clearer proof than that which Oomiah gave in this instance of his restless and ambitious character;\* indeed I have been informed, that he asked the collector at this time to be discharged from the British pay, unless Government restored the claimed rights,

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\* It being supposed by many persons that Oomiah possessed considerable wealth, I mentioned the circumstance to him one day. He said he had little or no money, probably property worth about two thousand rupees; that he had expended all he had collected, and given it to his followers and other persons. This is also the opinion of various men who were well acquainted with him. I observed that the report was, that he had treasure concealed in the Poorundur hill. His answer was, that there might be treasure concealed in the hill, but that his wealth consisted in the copper-plate deeds; for that being owner of these he was master of lacks of rupees; adding that they (the Ramoossies) were the proprietors of twenty-six forts, repeating the names of several. I instanced, however, Purtaubgur, south of Miabelleshwur, belonging to the Rajah of Satara, as one he certainly could not claim, for that Seevajee resided there, when he killed Abdulkhan, the Bejapor general. Oomiah said, "Purtaubgur belongs to me, for my ancestors captured it, and then placed it in Seevajee's hands."

and that his object in making such a request was, that he hoped to disconcert the collector, and make him suppose he intended to take to the jungles again.

There is certainly every reason to suppose, that had the claims he preferred against the Punt Suchew been yielded to him, he would immediately have put forth claims of a more extensive nature.

It is now time to think of casting a glance towards Sakoordy, to see this nian whose moral turpitude was such that he was apparently never happy except when he was plunging some of the inhabitants into misery and distress, by forcibly seizing their little property whenever he could manage to lay his hands on it.

On the 21st April, 1830, the Kykaries proceeded to the small village of Ambay, five miles northeast of Jejoory, and carried off property from an indigent Bunniah worth two hundred and thirty-two rupees.

Two or three days previous to this, some Ramoossies employed by Oomiah proceeded to Dhurumpoory, east of Phultun and upwards of fifty miles from Sakoordy, where on the night of the 21st April they plundered the Patell's house of gold and silver ornaments, and some rich clothes, altogether valued at two thousand rupees. Of this Oomiah received seven hundred rupees in gold ornaments, &c. and five hundred rupees in clothes; and he also seized the horse belonging to the Ramoossy who headed the gang; declaring he was a rogue, that he must have secreted part of the valuables, and threatened to hand him over to the magistrate of Poona to be punished. This speech was made no doubt to justify the retention of the horse. Subsequently, when Oomiah was pressed by the troops, the Ramoossy discovered where his horse was concealed, and recovered him.

It is necessary to state here, that it is but seldom indeed that so much property as this is to be found in the house of a Patell in this part of the country. But this man had been twelve years a confidential servant in the Peshwah's employ, and was intrusted with the money bags from which Bajee Row disbursed small sums in charity to the poor and others, when he visited the temples at Poona or elsewhere.

Although no regular complaints had been made against Oomiah by the persons whose causes he still was in the habit of deciding at Sakoordy, yet the collector having become acquainted with his nefarious proceedings, determined at once to check him; accordingly he directed him to expel forthwith from Sakoordy the two notoriously bad characters whom he employed, as Karkoons or secretaries, and a Karkoon was sent from Poona to succeed them. This put a stop to his interference in the complaints of the inhabitants.

In the end of April, it was known at Sakoordy that the Koolkurney of Ekutpoor, four miles north, had made preparations for celebrating the marriage of his daughter. On the night of the 1st May, the Kykaries and some Mhars plundered this Brahmun's house of gold and silver ornaments and clothes valued at one thousand four hundred and fifty rupees. Some of these ornaments had been merely borrowed for the approaching nuptials. The villagers reported the robbery to the Mamlutdar the following morning; and as Oomiah was so near them, and it being his duty to apprehend the robbers, they wrote to him, entreating him to seize the depredators or to recover the property.

Although rumours were in circulation that Oomiah was the instigator of many robberies, (and it was well known to many that these reports were founded on truth,) yet no one dared openly to accuse him. But as several of the inhabitants of villages within a few miles of Sakoordy had been plundered, the Naiks resolved on pursuing measures to remove suspicion from themselves. Three days after the robbery was perpetrated, they therefore sent to tell the Koolkurney that they had seized one or two of the persons that robbed his house, and had recovered a considerable portion of the property. A Mhar and an old Kykary were seized and sent to Poona to be tried for the robbery. The property (clothes) to the value of nearly seven hundred rupees was restored to the owner, whilst Oomiah made the Koolkurney give him a receipt in full, and promised that he would recover the rest of the property in eight days. The Naik never intended to act up to this promise. After



some time had elapsed, Mr. Giberne was informed of the particulars of this transaction. He therefore compelled Oomiah to deliver up the receipt to him, which he very properly destroyed.

The handing over to justice these two men, might be reckoned one of those cases where the interest and character of a person of an overbearing disposition, and possessing authority, is concerned; and the commission of an unjust act, however cruel will cost little or no consideration.

The unlucky Brahmun's daughter has not yet been married, and his friends are constantly calling on him to repay them the value of the ornaments borrowed, and which were lost on the above occasion. Again, on the night of the 16th May, the Kykaries proceeded to the small village of Naiegawn, and plundered a poor Bunniah of articles worth only about forty-six rupees.

About the same time two gangs started from Sakoordy, one to plunder a house in Waidesh, and the other went to Wurgawn Bhandy in Bheemthery: the latter party attacked a Brahmun's house in Wurgawn on the 19th of May. This gang was headed by Sukkia Ramoossy of Sassoor, and Rowjee Naik, subsequently shot at Walla. The Brahmun with a large stick stoutly defended his property against the Ramoossies, till the Naiks who were armed engaged him, and Sukkia inflicted a desperate wound of which he died in a few minutes; his servant was also badly wounded. The gang secured property here to the value of three thousand rupees. But as the inhabitants assembled to attack them,\* they were consequently compelled to make a rapid retreat. On their return to Sakoordy, they only produced articles worth about six hundred rupees, saying that they had been prevented searching the house, owing to the approach of the villagers. Notwithstanding this, Oomiah made them take an oath that they had not concealed any part of the property. It is well known that the leaders did conceal the greater part of it, and as Sukkia in effecting his escape from a party that went to seize him some months afterwards, broke his arm,

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\* A Ramoossy was wounded by one of the villagers on this occasion, and Oomiah expressed his disapprobation of their having killed the Brahmuna.

and died in the course of a week from a mortification that took place, and as Rowjee Naik was killed, the Ramoossies looked upon this as a just judgment on them, and attributed the death of these two men to their having perjured themselves in the above instance in the presence of their chief.

The Kykaries, accompanied by a few Ramoossies, started on the night of the 15th June for Pargawn, and plundered the Koolkurney's house of gold ornaments, cloth, and copper pots, altogether valued at six hundred and twenty-four rupees.

Again this band of Kykaries set out for Dorlychawary near Baramutty, where and on the night of the 10th of August, they plundered two houses. From a Brahmun's they carried off gold and silver ornaments, worth three hundred and sixty-two rupees, and from a merchant's house, gold ornaments valued at four hundred and six rupees. Two days subsequently they returned to Sakoordy, and were traced to the village by the Rukwalldar\* of Dorlychawary. These men pressed Oomiah to restore the property, and offered bribes to some persons at Sakoordy to aid them in recovering the gold ornaments, but in vain. The Rukwalldars accordingly returned to their village, and informed the parties concerned of their having traced the robbers to Sakoordy. The Brahmun and the merchant repaired to that village, but succeeded no better than the watchmen in their application for the restoration of their property; and from hints which they received, they thought it would be most advisable for their own future safety to remain quiet, and to say nothing more on the subject.

On the night of the 23d of August, a party of the Poo-rundur Ramoossies, employed by Oomiah, plundered the house of the Despandia of Allundy, near Keekvy. This party secured gold and silver ornaments, and some pearls, &c. valued at one thousand seven hundred and ninety-six rupees, which they conveyed to Sakoordy.

With the exception of a party of Ramoossies sent into

\* This Ruckwalldar was a brother of Bhojajee Naik's; he is a quiet and rather well disposed man, and rendered considerable service to me.

Phultundesh in the end of September, where they perpetrated two or three durrorrahs, Oomiah during his stay at Sakoordy engaged in no more robberies.

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## CHAPTER XIV.

Oomiah's plundering career checked.—He persecutes a Ramoossy and his associates who committed a robbery in Poona.—This Ramoossy, named Hunmunttoo, informs against Oomiah.—After having secured a pardon for himself, Hunmunttoo is active in taking his revenge.—The officer commanding a detachment advances to Sakoordy.—Oomiah's followers assault Ramnoo Ramoossy that accompanied him.—Ramnoo detained a prisoner.—The magistrate directs Oomiah to set Ramnoo at liberty.—Oomiah's followers retire to the adjoining hills.—Oomiah compelled to quit Sakoordy and to reside at Poona.—Several Patells give security for his good behaviour.—Reflections respecting Oomiah's detention at Poona.—He quits that town.—Remarks regarding his conduct while he was employed at Sakoordy.—His connexion with the notorious Kakajee.—Their proceedings.—The anxiety of some Sardars to obtain some treasure belonging to Bajee Row, Eak-e-hwa.—They employ Oomiah to accomplish their object.—He fails in the attempt, the maces, and his people taken to Satara.—Oomiah endeavours to be revenged on the tinkers in whose possession the money was said to be.

To understand, however, what eventually led to the check given to Oomiah in the plundering career he had been pursuing, and to his being subsequently obliged to remove to Poona to reside, it is necessary to revert to a robbery that was committed on a Shastri's house at Poona, near the Veer Cha Kazzeena, on the night of the 22d of September, 1829.

A Ramoossy named Hunmunttoo, of the small village of Panoury, close to the Poorundur fort, with several of his tribe and some notorious Kolies of a neighbouring hamlet, plundered the house of Mungul Shastri on the before-mentioned night, of property worth about one thousand rupees. A few days afterwards, Hunmunttoo wishing to propitiate Oomiah's good will, sent him by a friend two pieces of cloth worth about thirty-five rupees.

This was not a style of proceeding likely to meet with Oomiah's approval; a Poorundur Ramoossy heading a gang and committing a durrorrah without his sanction, and after having perpetrated the act, to have the effrontery to tender such a trifle as an offering.

The Naik indeed evinced much dissatisfaction on this occasion, and sent to require Hunmunttoo's presence to discuss the affair; but the latter having taken the alarm, avoided the messenger, who forced a younger brother of his to

accompany him to Sakoordy. Oomiah threatened to seize every one of the party, and to send them to Poona to be tried for the robbery they had committed. He succeeded in extorting a sum of five hundred rupees in cash, and a promissory note for one hundred more, from Hunmuntoo, who compelled his associates to pay a portion of the demand. Oomiah no doubt wished to convince the people of his supremacy, and now seized Hunmuntoo's brother and several of the party, and actually forwarded them to Poona, where they were tried and condemned to hard labour. A few days after Hunmuntoo paid the money, which he effected with great difficulty, Amrootah, an elder brother of Oomiah's, proceeded to Panoury and plundered his house and maltreated his family.

Having still a hundred rupees to pay of the fine, and being completely disgusted with Oomiah's conduct, and by the distress and misery which he had caused, not only to himself, but to several of his friends, Hunmuntoo at length resolved to quit his village, and to be revenged on Oomiah in return for the ill-treatment he had experienced at his hands.

A detachment of the 11th Regiment was employed under the collector's orders to apprehend some Ramoossies who had committed robberies in the vicinity of Poona ; with this detachment there was a Ramoossy named Rannoo of Yewut, well known at Poona during Mr. Elphinstone's residence in that city. Hunmuntoo having communicated with Rannoo, under a promise of a pardon being extended to him, (for his participation in the robbery committed in September 1829, at Poona,) engaged to make known some important particulars respecting the robbery which took place at Wurgaun Bhandy in May 1830, when the Brahmin was killed. Matters being thus far settled, the detachment in the course of a short time seized several of the Ramoossies who had been engaged in this robbery ; but on the representation of Hunmuntoo, that two men of this party were living under the protection of Oomiah, the officer commanding the detachment sent a note to him, calling on him to deliver up the two men in question ; but as Oomiah detained the messenger, the officer sent his de-

tachment forward to Sassoor, and accompanied by the Ramoossy Rannoo of Yewut, he proceeded himself direct to Sakoordy. This was on the morning of the 12th October. He approached the village, and was instantly surrounded by Oomiah's armed followers. His attention was presently directed to Rannoo's situation; several of Oomiah's men having disarmed him, were beating him so unmercifully that he fell down senseless from their blows. The officer remonstrated with these ruffians for treating one of his followers in so cruel a manner, when they recommended him to quit the place immediately if he regarded his own safety. It is stated that they used abusive language, and added, Rannoo of Yewut had no right to come into their district to usurp the authority which had been intrusted to them.

When the officer commanding the detachment reached Sassoor, the assistant collector stationed there, immediately dispatched some horsemen to Sakoordy with a message to Oomiah, directing him to set the Ramoossy Rannoo at liberty. Oomiah paid no attention to this order. He intimated merely, that he wished that Hunmuntoo, who was under Rannoo's protection, should be seized and sent to Sakoordy, as he possessed sufficient evidence to convict him of having been concerned in several robberies. Oomiah was anxious to avoid the consequences of his rash and violent conduct, by accusing Rannoo of protecting Hunmuntoo, who had been guilty of various robberies; but a peremptory order from the collector reaching Sakoordy the next day, to release Rannoo, was complied with, and Rannoo proceeded from Sakoordy to Poona.

The day on which this encounter with Rannoo occurred, Oomiah with all his followers quitted the village of Sakoordy, and took up their residence on the adjoining hills. They never afterwards returned to sleep in the village even during Oomiah's stay at Poona, when all differences appeared to be settled.

As Oomiah's conduct was considered highly reprehensible, and his proceeding on the 12th October too violent and insolent to be overlooked, Government came to the

determination of displacing him from the situation he held in the police of the Poorundur district.

I may be allowed to state, that I received a letter from the Secretary to Government on the afternoon of the 17th October, by which I was directed to proceed immediately from Ahmednuggur to the Mhabelleshwur hills to wait upon the Governor, where I learned that it had been finally determined that Oomiah should for the future reside at Poona; that his pay of forty rupees a month should be continued, and that his brother Kristnajeel should be placed in charge of the men at Sakoordy. Oomiah was to be informed that he would be allowed eight days to prepare for his removal to Poona, and at the expiration of that period, should he not conform to the orders of Government, that the troops would be employed against him to compel him to submit.

I was called on to furnish a memorandum of such measures as it might be considered advisable to adopt, in case of its being necessary to commence operations against this troublesome character; and at the same time a detachment from the force stationed at Poona was ordered to hold itself in readiness to march on the shortest notice. Oomiah however deemed it prudent to obey the order, and he repaired to Poona with his family on the 5th November, being the last day of the period allowed to him.

The Patells of five villages in the Poorundur district entered into security that Oomiah should remain at Poona, and not quit the place without the permission of the magistrate; and Government advanced two hundred rupees for the purpose of building a house for him.

Hopes were entertained that he would now become gradually reconciled to a quiet and peaceable life; and that he would submit to the restraints to which he had been subjected, yet an indulgence in such expectations evinced a want of knowledge of Oomiah's real character.

It was natural for him to long for the society of the friends he had left in his native hills, where he was a person of consequence; and the recollections of the bustling, and to him interesting, scenes he was in the habit of enjoying at Sakoordy, must have rendered his residence at Poo-

na particularly irksome to him, where he met with little or no consideration.

When traversing the large town of Poona, he no doubt encountered many discontented and evil disposed persons, (as he himself has said) who urged him to fly to the jungles. There was a commixture of circumstances which induced him to resolve on extricating himself from the unpleasant situation in which he was now placed. He therefore wished to put his fortune to the hazard once more, under the sanguine hope of triumphing over all the obstacles that might be thrown in his way, to prevent his resuming authority at Sakoordy. He had remained about five weeks at Poona, being satisfied that Sir J. Malcolm had quitted Bombay, and that he might with safety take his departure, he one evening quitted the place. He remained concealed with his friends till the middle of January, 1831. when they proceeded towards Bhore, as shall be hereafter related.

A few days after Oomiah had left his followers, and proceeded to Poona to reside, a party of Ramoossies marched for Waiedesh and plundered the house of a Shastry at Dhorne, near Waic, on the night of the 9th November. They secured gold and silver ornaments valued at eight hundred and ninety rupees.

As it may appear somewhat singular, that such a minute account should have been obtained of Oomiah's proceedings while he remained at Sakoordy, and that the magistrate of Poona should have permitted such villany with his jurisdiction, it need only be observed, that I received the information from several of the persons who were most actively engaged in the transactions related, and that many of the particulars were communicated by the sufferers themselves.

The commission of several of these atrocious acts came to the knowledge of the magistrate by public rumour; for in the few instances that the sufferers ventured to brave Oomiah's power, the magistrate exerted himself to do justice to the complainants.

The precautions that were adopted by this crafty Ramoosy to prevent any complaints against himself reaching

the magistrate's ear, have been already explained, viz. his taking a paper to that effect from those he oppressed, and then his shamefully handing over to justice the persons he occasionally employed as the instruments of his tyranny ; — again his profound dissimulation and constant professions of innocence, when he was charged with committing or conniving at these outrages, and the ease and ingenuity with which he could prepare his defence, by procuring as many persons as he might require to give evidence on oath on any points which might suit his views ;—moreover, the anxious wish of the inhabitants to stand aloof from any cause in which they would be required to give testimony against him. All these circumstances operated against the magistrate's becoming fully informed respecting the proceedings which have been described.

The notorious Brahmun Kakajee, who was executed at Ahmednuggur in March, 1830, and who stopped Lieutenant C——, 3d Regiment Native Infantry, on his march from Ahmednuggur to Poona, and plundered him of his horse and watch, &c. passed the rains of the preceding season with Oomiah at Sakoorly. This Brahmun kept his few followers well mounted. He and Oomiah bound themselves by an oath in the temple at Jejoory, to support each other in the plundering system which they engaged to carry on. Kakajee persuaded Oomiah to call on several Patells of villages on the banks of the Neera river, to consult them about furnishing him with a body of horse. When the Patells learnt that it was Kakajee's intention to employ them in committing depredations in various parts of the country, they refused to listen to Oomiah's propositions, aware of the difficulties and dangers in which a compliance would ultimately involve them. After this disappointment, Kakajee continued to act with his small mounted gang with as much secrecy as possible, till they were apprehended near Ahmednuggur.

Oomiah mentioned that Kakajee gave out that his name was Godajee Danglia, a relation of the famous Trimbukjee Danglia's ; and that he had come from Bhajee Row, the Ex-Peshwah ; that he was determined to destroy and extirpate the English. Oomiah mentioned other particulars



said to have been communicated by Kakajee : he stated that the Brahmun had sent him a hoondy (bill of exchange) for two and a half lacks rupees, on Sahoo-kars at Phultun, which proved to be forgeries ; and that he afterwards reported the circumstance to the collector at Poona. This was a story made for the occasion, for Oomiah knew well that Kakajee had not been near Bhajee Row, nor had he any authority from him to act as he proposed. I have seen a man noted for his moral and religious character, who was well acquainted with the proceedings of these robbers, and was present when they pledged their faith to each other, but when interrogated on the subject, he denied it altogether, but subsequently evinced much sorrow for having been guilty of such a falsehood, and added, that it was the dread he entertained of Oomiah, which induced him to withhold the truth.

It may be considered that I have entered too particularly and circumstantially into the history of Oomiah's irregular proceedings when in charge of the police of the Poorundur district ; but my object in doing so, has been to represent to the reader the busy, tyrannical, and dangerous character of the Ramoossy. I shall however close this long chapter of his adventures with the following account of his failure in obtaining possession of one of the largest prizes on which he had fixed his attention.

During the period that Trimbukjee Danglia was concealing himself in the Mhadeo hills, after he had escaped from Thanna, the Peshwah Bajee Row kept his favourite well supplied with money, although His Highness publicly denied all knowledge of his place of retreat. A sum of money, to a large amount, having been deposited with some Sahoo-kars in the town of Phultun, for Trimbukjee's use, remained it is said in their hands when hostilities commenced between the British and Mharrattas, in the year 1817 ; and in consequence of the confusion that ensued, the Peshwah having proceeded to Hindoostan, and Trimbukjee having been apprehended the money remained still unclaimed. If this was really the case, or what afterwards became of it, I do not pretend to say, but only relate what has been communicated to me as fact.

At the time of the first disturbance in which Oomiah was engaged, it is said that two Jageerdars, who were Sirdars (officers) of the Poona Court, and who were acquainted with the circumstance, became anxious to get this money or part of it into their possession, and the plan they adopted to try to secure the prize, and to remove all suspicion from the Sahookars, was as follows.

They prepared the usual bills of exchange with a list specifying the different descriptions of coins, (chiefly gold mohurs,) to which they annexed the Peshwah's seal, which they had in their possession. They then engaged a Goossyne who had lately come from Hindoostan, and partly communicated to this man their scheme, and the part they wished him to act in the plot. Having intrusted him with these documents, he was instructed to give out, that he had come from Bindrabund, (Bhajee Row's place of exile on the banks of the Jumna,) on a confidential mission to some of his friends in the Dekhan. He was now directed to proceed in search of Oomiah, and to impart to him the plot. The papers were to be placed in Oomiah's hands, who was to negotiate the business with the Sahookars. Oomiah was to inform them that the disturbance he had created, and the annoyance he had caused to the British Government, was highly approved of by the Peshwah Bhajee Row, and that His Highness was anxious to furnish him with funds to carry on operations on a more extended scale.

This Goossyne proceeded to Jejoory, but after a considerable lapse of time he did not succeed in meeting the Ramoossy Naik. A short time after this Oomiah was pardoned; he and Kristnajeel Naik had an interview with these Sirdars, (one of them is since dead,) and they told him that he should have a large portion of the money, if he succeeded in getting it out of the Sahookar's hands.

Oomiah sent on one of his brothers to make some inquiries: and he then gave the papers to the Patell of Bhewndy, who proceeded with an escort to Phultun to demand the money; but as the Sahookars started some objections, the party returned to Sakoordy, and afterwards proceeded a second time to Phultun. It is stated, that

the Sahookar was on the point of handing over the money to Oomiah's people, when something took place which excited his suspicion; and in consequence he went to the Mamlutdar and reported the circumstance, and eventually denied having any money in his hands belonging to the Peshwah. The affair being referred to the Rajah of Satara, he directed that Oomiah's people should be sent to him. A few days after the party reached Satara, they all absconded, with the exception of the Patell; and after some detention he was also set free. The failure of this scheme was a grievous disappointment to Oomiah. The Sahookar states now, that he informed Oomiah's people and the Rajah's officers that he had no money belonging to Bhajee Row—that he would pay double the amount demanded if such could be proved.

About eight months after this, the Phultun Sahookar came to Baramutty to settle some private affairs, which circumstance no sooner came to Oomiah's knowledge, than he dispatched a dozen Ramoossies, who arrested him, and brought him a prisoner to Sakoordy. This took place in the beginning of 1830. When the Sahookar had been eleven days in the Hetkurries guard at Sakoordy, after many threats and intimidations he agreed to give Oomiah nine hundred rupees; and upon giving security for the payment of this sum he was permitted to return to his home. In the mean time his family had represented the circumstance to the Rajah, and a communication was consequently made to the magistrate of Poona. The Sahookar was subsequently sent for by the magistrate who repaid him the nine hundred rupees, the amount having been deducted from Oomiah's pay.

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## CHAPTER XV.

When Oomiah absconded from Poona the collector called on the Ramoossy Naiks, &c. to seize him and to bring him back to the capital.—The Naiks deny all knowledge of his place of retreat.—Discussions with the Naiks.—They are warned of the consequences, in case of their disobeying the orders of Government.—Some horsemen wounded.—The Ramoossies disposed to begin to plunder.—A detachment from Poona marches to Sassoor, and from Satara to the Sapie Ghaut.—Detachment advances to Jejoory.—Oomiah and the Bund proceed to Bhore, plunder Bazar wary, and seize two Brahmuns.—Skirmish with Captain Boyd at Mandurdeo.—The Bund separate; their distress.—Oomiah returns to the Poerundul hills.—Several of the gang seiz-

ed—Detachments from Shollapoor, and from the Konkan, to secure the passes in the Syadry Ghauts.—An attempt to surprise Oomiah failed.—Rewards offered for the apprehension of the Naiks.—Oomiah surprised near Goolimchy.—He rejoins his brother and Bhogaye Naik in the hill south of the Neera.—They address proclamations to all the Ramoossies, calling upon them to join them at the fort of Poorundur.—The Bund are surprised near Walla.—The Koies quit it.

The circumstance of Oomiah's<sup>2</sup> having absconded from Poona on the 16th of December, became no sooner known to the collector, Mr. Giberne, (who at the time was in the district sixty miles east of Poona,) than he called on the Ramoossy Naiks in the pay of Government, and the Patells who were security for Oomiah, to seize him, and take him back to the capital. These men replied, that they were ignorant of Oomiah's place of retreat, but that they would endeavour to discover it, and that he (the collector) might depend on their discharging their duty faithfully—at the same time observing that Oomiah must have been persuaded by some persons in the pay of Government to fly from the place.

Some of the Naiks subsequently visited Poona; they invariably pleaded ignorance of Oomiah's place of retreat, stating that as no information could be gained respecting him, it was evident he must have proceeded to a great distance, and most probably into the territory of some foreign prince.

Towards the end of December, accounts from Sakoordy stated that the men employed there (the Ramoossy Naiks and their Sibundies) had quitted the village, and were residing in the adjoining hills, and that a number of persons were assembling from different parts of the country. The Naiks showed considerable backwardness now in visiting Poona; and although they still boldly denied knowing any thing concerning Oomiah, all the people of the district who took an interest in the matter, were quite satisfied that Oomiah had joined his friends at Sakoordy.

Government was well acquainted, from long experience, with Oomiah's talent for carrying on with singular success a predatory system of warfare, and was anxious to avoid the consequent trouble and expense that would necessarily follow, if hostilities were commenced against him; although, at the same time, fully convinced of the necessity of crush-

ing this troublesome character, who by his activity and cunning had hitherto escaped with impunity, notwithstanding the numerous crimes he had committed.

The collector with his usual zeal exerted himself to conciliate the Naiks, and urged them to remain faithful to their duty. But as no reliance could be placed on these men, and as much activity and excitement existed at Sakoor<sup>dy</sup>, it was finally resolved to march a detachment into the Poorundur district to act against the Ramoossies, should they set the Government authority at defiance.

Previously to my quitting Poona for Poorundur, an order was written by the magistrate, and several copies of it given to the three Ramoossy Naiks, who had been at Poona for some days. The order was dated 11th January, 1831, and addressed to the twelve Naiks, (including Oomiah's name,) and their men in the pay of Government, directing them to repair to Sassoor, (only six miles from Sakoor<sup>dy</sup>) on Friday the 14th January; and having reported their arrival to the officer commanding the detachment, they were directed to obey such orders as he might issue to them; and that in the event of their disobeying this order they would be considered as rebels, and treated accordingly.

Much pains had been taken in explaining to the three Naiks, the propriety of their exerting their utmost efforts to dissuade the other Naiks from acting in opposition to the orders of Government, and the inevitable ruin and distress they would entail on themselves and families, if they disregarded the advice now given to them.

The three Naiks proceeded to Sakoor<sup>dy</sup>, solemnly declaring that they would punctually repair to Sassoor on the 14th, whether they were joined by the others or not; and that they were determined not to act so foolishly and madly as to join men who would think of fighting against the state.

Early in January there were reports in circulation, that the Ramoossies intended to commence their depredations immediately. On the night of the 8th January, two men of the Poona horse who halted at Wurky on their route to join their detachment at Soopah, were attacked by a body of armed men, who wounded and then plundered

them of several hundred rupees in cash which they had charge of, besides other property. Two days afterwards several persons were robbed south of Poona in the day-time, and an attempt was made to seize some Sibundies conveying pay to the men employed on the hill fort of Poorundur.

These occurrences indicated the designs of the Ramoossies, and left no doubt that the Naiks were ready to begin their operations, whilst it was evident that they wished to induce the Government to adopt some decided measure towards them, in order that it might appear to the public, that they (the Ramoossies) were not the aggressors. They therefore resolved for the present to carry on their schemes as secretly as possible, and by such a line of conduct, they expected to be always able to keep a door open to negotiation, and to justify such outrageous acts as they might commit.

No persons were better acquainted than these Naiks, with the comparatively limited resources of Government at this time, owing to the great reductions of the military establishment. They were also aware that great reluctance existed to sending any troops into the field, but more especially against themselves; for they (the Ramoossies) were satisfied that the inhabitants of the late Peshwah's dominions were convinced that Government had completely failed in putting down the Ramoossies during their former disturbance, after carrying on operations against them for a series of years; and rather than continue such expensive and fruitless measures, their demands were fully complied with. Besides, the Naiks were well aware of the feeling of a great portion of the population towards themselves. They knew that they had the good wishes of the numerous discontented persons scattered over the country, and many of the lower orders whom Oomiah had conciliated by his liberal treatment.

It may be added, that these men aspired to the hope of not only being able to prevail on Government to sanction Oomiah's restoration to the charge of the police of the Poorundur district, but they also expected, that the Government would compel the Punt Suchew to restore to them allowances which they claimed as their right.

On the night of the 10th January, Oomiah, who had as yet only shown himself to the Naiks and some of his relations, detached about twenty Hetkurries and fifteen Ramoossies to plunder a merchant who lived in Andoor, a small village two koos south of Walla. This party was under the direction of his cousin Bappoo Soleseykur, and Dhoondy Pcessa (a Koonby who fled from Bhore and was with Oomiah the evening he left Poona.) The former gave information that this merchant had some gold and silver ornaments in pawn, which he was about to send to Waie. The gang proceeded to the village, and returned the following morning, having secured the ornaments and carried off such other articles as they could lay their hands on: the value of the property taken was one thousand three hundred and fourteen rupees.

The detachment from Poona, consisting of three hundred men of the 17th Regiment under Captain Luyken, reached Sassoor on the 13th January: several letters passed between Mr. Giberne and the Naiks in the interval. They still maintained that they were ignorant of Oomiah's place of retreat, and they now begged that the troops might not be marched against them, and that they might be allowed eight days to fulfil their promise of trying to apprehend him.

The Naiks now sensible that Government were resolved on projecting some very active measures for apprehending Oomiah, and probably curtailing eventually the Ramoossy Ruckwalldarship, (police authority which had worked so unfavourably, and proved to be such a bane to the district where it existed,) commenced an evasive and temporizing system of proceeding, evidently for the purpose of affording them time to prepare themselves, and to enable their families (which they sent away from Sakoordy) to get to a distance: this was their object in asking for eight days more, under the pretence of searching for Oomiah. The families\* proceeded into the Nixam's country, near Perinda, with orders to move towards the Soorapoore Rajah's territories (who is a Berrdur) southeast of Beejapoor, should they be pressed by any of the detachments; and

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\* Of the three Naiks who made such strong professions of fidelity before they quitted Poona with the order for Sakoordy, two moved off with the families, and the third Wittoo accompanied Oomiah to Bazar wary.

to remain in Soorapoore till they (the Naiks) had settled their affairs at Poorundur.

Of a detachment of three hundred men of the Grenadier Regiment, ordered from Satara to co-operate against the Ramoossy Bund, unfortunately two hundred men only could be spared till the Rajah had returned to his capital. On the 14th January, a letter of instructions was addressed to the officer commanding the Satara detachment, who had perviously been directed to march on Salpie. The detachments were posted in particular positions, near hills, ravines, and jungles, selected as being well known and much frequented by the Ramoossies. These detachments were to consist of forty men each, either under an European or Native officer ; and such suggestions as were considered necessary, were communicated to each party, particularly respecting the grounds they were to occupy, the necessity of great and constant vigilance on their part at all times, but especially during dark nights, to guard against being surprised. They were directed to search constantly the hills, ravines, and jungles within a certain distance of their positions. They were instructed to communicate frequently with each other, and how to act should the gang pass them ; to conciliate the inhabitants ; to trust to each other only, and to place no confidence in the village watchmen. Captain Boyd, the officer commanding the detachment, was requested to take up his position near Bhore, as it was conjectured that Oomiah would, on quitting the Poorundur hills, move in that direction. Under the expectation that the different detachments above alluded to would reach the various positions allotted to them by the 17th and 18th, Captain Luyken with a detachment of eighty men marched on the 16th to Jejoory, and another detachment of forty men to Keekvy ; and the following morning Lieutenant Knipe, 17th Regiment, proceeded to Pureenchy with forty men, and Lieutenant Macan, 17th Regiment, to Sewry with a detachment of the same strength.

When the gang proceeded from the Sakoordy hill to the Khurry Puthar, where there is a temple sacred to Khondobah, Oomiah showed himself to all his followers, and



the Naiks and their retainers took an oath of allegiance to him on the occasion.

Several very wild schemes for conducting their plan of operations, were suggested by various individuals of the assemblage. Some of them wished to set fire to the se-poy's huts in the cantonment of Poona ; some spoke even of burning the city ; others proposed to attack and plunder an officer's family residing on the Poorundur hill, while some suggested an attack on the district treasuries ; but Oomiah overruled all these propositions, insisting on the propriety of carrying on their operations with secrecy ; and pointed out the disadvantages likely to result from acting precipitately. It was settled that they should in the first instance proceed into the Punt Suchew's country, and compel him to grant to them the rights and emoluments which they had been claiming so long in vain.

At this time there were assembled on the Kurry Puthar about three hundred and fifty men with Oomiah. Many of them were most desperate characters, who had figured in the former Bund. Among them also were several notorious Ramoossy Naiks from the Satara territory and from Bhore, all of whom had been proscribed by their own Government for the numerous atrocities which they had committed.

But it was not Oomiah's intention to keep his followers in one body for any length of time. He was aware of the difficulty of being always able to procure food for any large number of men, especially when forced to keep in the hills at a distance from large villages ; and he well knew the movements of any considerable number of men must attract observation.

He proposed employing about two hundred Kolies in the hills in the Joonere and Nassick districts, and an equal number of Mangs in the direction of Shollapoor and the Nizam frontier villages at the same time, to act in concert with him. One of his Jemedars, a Mussulman, has stated in his deposition, that a Patell of a village near the Salpie Ghaut, offered to bring a body of horse from the Nizman's country to act as Pindaries ; but this was not approved of at the time.

It was Oomiah's decided wish to strike a blow should a favourable opportunity offer, in hope that it would give encouragement to those who had espoused his cause, and the numerous disaffected persons who were anticipating advantages which might be desired, from the confusion which would thus be produced in the country. It was not his plan to incur the risk of fighting our troops on fair or equal terms, but to harass, distress, and fatigue them by rapidity of movement, by means of false reports, and keeping as much concealed as possible, never making a stand when discovered, unless it was in strong ground, when he could reckon on effecting a safe retreat. He well knew that he must meet our troops at great disadvantage. It was therefore his policy to avoid by every means meeting with us, and above all to prevent the inhabitants from taking any active part against him.

It ought to have been noticed before, that nine of his Sibundies quitted Oomiah on the 12th, and proceeded to Poona, conformably to the collector's order sent the preceding day to Sakoordy ; so that of the men in the pay of Government, ninety still remained with him. Of these, thirty were Hetkurries,\* and there were thirty more of these men who lived at Sakoordy and Jejoory on Oomiah's bounty, and who now joined his standard ; so that the gang in the present instance, was much more formidable than during the former Bund, for the Poorundur Kolies had joined the Ramoossies on the present occasion.

The Ramoossy Naiks had profited by the experience they had gained in the former Bund, and by the result of the disturbance that had taken place during two successive years in the Ahmednuggur district, and the Kitore country.

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\* These men were particularly well armed. Their guns were stocked after the European mode, and had locks, the barrel being that of a matchlock gun ; they carry a sword and dagger also, and provide themselves with powder of a better description than is generally procurable in the bazars. It may be further observed, that these are the same description of men who proved of such eminent service to Sewajee during his extraordinary and adventurous career, when he wrested for himself a kingdom from the formidable but disunited Mahomedan Princes of the Dukhan. They are of the agriculturate class, and are considered able, good and extremely faithful soldiers. They are inhabitants of a district called Hett, near Sawant wary in the Konkan.

When Captain Luyken reached Jejoory, the gang were visible on the Khurry Puthar.\* The inhabitants were much disinclined to give any information respecting them, and mentioned in the present instance, that the person seen were some pilgrims.<sup>1</sup>

The gang sounded their horns, and fired off a few muskets by way of bravado, when they saw the detachment reach Jejoory.

Captain Luyken ascended the Khurry Puthar hill during the night. On reaching the summit after considerable labour, for the sides are steep, he learned that Oomiah and his followers had moved off about sunset, but whether in an easterly, southerly, or westerly direction, no one would inform him.

It appears from the statements of many members of the Bund, that there was some intention at one time on their part to surprise the detachment, by a night attack; that the Naik Essoo Neckary of Singhur had even advanced a short distance with about fifty men for the purpose of proceeding to occupy some convenient position to co-operate with the main body; but on consideration, they thought it most advisable to postpone their plan of acting on the offensive.

The gang halted during the night and the following day on the hills near Mhour and Mandur, and obtained food from the inhabitants of the surrounding small villages, many of whom were Oomiah's most intimate friends. During this night and the following, upwards of a hundred men quitted the gang, some of them dreading the consequences of remaining with Oomiah when they found that active and vigorous measures were commenced against them: it also

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\* The hill called the Khurry Puthar may be about six hundred feet high, and very nearly a mile south of Jejoory. The top of the hill is level, and consequently called Puthar, which is a term for any flat elevated district, or plain on a hill. Khurry is the name of the small river which rises near Garady and runs along the pretty little valley of Sassoor towards Baramutty, and joins the Neera a few koss from thence.

There is a branch which runs off from the northeast extremity of the Khurry Puthar, nearly in a northerly direction, gradually diminishing in size to the village of Jejoory. On the extremity of this shoulder or branch from the main range, is erected the principal temple of Jejoory, and dedicated to the god Khundobah or Khundy Row. The hill here may be about two hundred feet high.

having soon become known among them, that a considerable detachment of the Ahmednuggur Police Corps had arrived at Sassoor to take a part in the operations against them. It is to be observed, that the Ramoossies were well aware of the success of this corps when employed in suppressing similar disturbances in the Ahmednuggur district, (particular allusion to this circumstance was made in the depositions of some of the prisoners afterwards apprehended.) Oomiah crossed the Neera river with about two hundred and fifty men on the evening of the 17th. Shortly after they had crossed the river, they discussed the propriety of attacking Bhore, or setting fire to the town, but this intention was relinquished, and they proceeded to the small village of Bazar wary, which they plundered, and seized two of the Punt Suchew's Brahmuns, whom they carried off with them to the Mhandurdeo hills, southeast of Bhore. Oomiah compelled these Brahmuns to write a letter to the Punt Suchew, demanding of him to restore their rights to them immediately, and threatening, in the event of his refusal, to plunder and ruin his country.

About nine o'clock in the morning of the 18th January, a party of the Punt Suchew's people who had been searching for the men who had plundered Bazar wary, ascertained that Oomiah was in the Mandurdeo hill with the gang. This party proceeded towards the hill, and on perceiving them sent intelligence of the circumstance to Bhore (exaggerating the number to five hundred.) Captain Boyd immediately proceeded to the spot with his detachment. The Ramoossies had taken up a strong position on a high and steep hill, covered with bushes of the prickly-pear, and which the members of the gang knew well how to take advantage of for the purpose of protecting themselves from the fire of the detachment. The necessary disposition having been made, the detachment advanced and engaged the Bund, but as Captain Boyd ascended the hill, the Ramoossies retired, and fled upon the sepoys reaching the summit. Three of the Ramoossies were afterwards taken; however none of the gang received the least injury from the fire of the detachment, but a Naik and sepoy were wounded of Captain Boyd's men. The Sibundies belong-

ing to the Punt Suchew do not appear to have rendered much assistance to Captain Boyd; indeed, he mentioned that these men took their departure shortly after the firing commenced.

The Bund much alarmed now separated upon retiring from the Mandurdeo hills. About fifty accompanied Oomiah to the neighbourhood of Pandoogur, and an equal number went with Bhojajee to the southeast; the rest fled in various directions. Essoo Neekary, Kristnajee Naik, and Witto, returned to the Poorundur hills for the purpose of collecting more men; but all their adherents were so pressed in the vicinity of Poorundur, that they gave up every intention of adding to the number of the gang. A hundred men of the 1st Grenadier Regiment having arrived from Poona, Lieutenant Foulerton was posted with fifty men at Bhongoly to guard the south side of the Poorundur hill.

The two Naiks with their followers were now anxious to reunite, but in consequence of being pressed by the several detachments that were following them, they crossed each others route unawares, Oomiah having gone to the Choundeshwur hills east of Waie, while Bhojajee went to the mountains near and to the north of Mhabelleshwur, where he remained for a week, procuring food from the Jungums (the priests of the Linggait caste) who reside on the top of some of these hills, and from the Dhunggurs or cowherds who live in those wilds.

Oomiah soon returned to the Poorundur hills with his party; but the inhabitants were still greatly afraid of communicating information respecting his movements, and when they did give intelligence, it was always after the Bund had moved off from the place, and too late to be of any advantage. About this time Lieutenant Shaw, 9th Regiment, from Shollapoor, took up a position at the Mahdeo temple, southeast of Phultun, with seventy-five men; he was directed to post a Jemadar's detachment at a village half way between his own position and the detachment at Salpie, to keep up the chain of communication. Lieutenant Forbes of the 13th Regiment, and Lieutenant Christopher of the 11th Regiment, occupied the passes leading down

from the Dekhan to the Konkan, and were in close communication with the officers above the Ghauts.

Several prisoners were now seized, and information obtained that Oomiah was to receive provisions at the small village of Peemptry (nearly two miles south of Sassoor and close to the hills) on the night of the 24th January. As provisions are always placed in the vicinity of water, two detachments moved from Sassoor early in the evening, in opposite directions, with orders to approach by a circuitous route, a well and a pool of water, both being between the village and the hills, and then to conceal themselves as well as the ground would admit of. The night was beautifully bright, and they returned at two o'clock in the morning, without having seen any thing of the gang. It may however be mentioned, after Oomiah was seized, he one day observed that he had been deprived of his food at Peemptry, for that as they were approaching the place, they saw the detachment, and consequently proceeded to a village two miles distant.

This portion of the gang having now moved into the Allundy range of hills, rumours of large bodies of men being seen during the night time in the villages east of Poona, were in circulation. The gang concealed themselves in the day time, among the prickly-pear bushes on the hills; and, wrapped up in their black kumlies (blankets) resembled so many wild hogs (as they have often themselves described.) They were not permitted to move from the spot they occupied, under any pretext whatever, unless their concealed sentries announced the approach of some danger.

For the purpose of procuring provisions, they usually proceeded in the evening to the vicinity of some village, and then they sent one or two men to announce to the Patell that a supply of provisions was required for the gang; all of them afterwards entered the place, if it was a small village, or if they had relations or friends among the inhabitants, and provided there was no chance of their being surprised. In the event of any danger being apprehended, two or three baskets containing a sufficient quantity of bread to admit of each man having two or three

cakes, with a small quantity of greens mixed up with salt and a large proportion of chillies (red pepper,) were conveyed to some well in the vicinity. If there were any persons of higher caste than Ramoossies, some flour, &c. was supplied, and those for whom it was intended prepared their own bread. The gang occasionally obtained a sheep from any flock that might be grazing near them. Should the shepherd be clamorous for the price, after threatening him, they would probably throw him a few pyse. When the inhabitants of a small village objected to furnish them with provisions, some of the members of the gang used at times to beat such persons severely. In November, 1827, they shot a man dead at Kandalla, near the Kamatyky Ghaut, who offered resistance, and they took away his horse with them. When the Ramoossies were pressed by the troops, they contented themselves with a very scanty supply of provisions; this they procured very irregularly, and by stealth, frequently paying for it, in order to conceal their movements: and if they were unacquainted with the localities of the place, they made one of the inhabitants act as guide on the occasion—and in general they vowed vengeance in case of his betraying them.

As it was understood that Oomiah had procured food from his friends at Sakoordy, and that he was in the hills near that place, five detachments moved from opposite directions into the hills, early in the morning of the 29th January, but had not the good fortune of falling in with any of the Ramoossies. They had quitted these hills the preceding evening.

A proclamation was now published, explaining, that notwithstanding the great lenity and kindness so often shown to Oomiah, he had disregarded all the obligations he was under to the Government, and had recommenced plundering the country, and distressing the inhabitants. A reward therefore of five thousand rupees in cash, and two hundred beghas of land in enam (freehold,) was offered for the apprehension of each of the four principal Ramoosy ringleaders of the gang, viz. Oomiah, Krist-najee, Bhojajee, and Essoo Neekary.

On the 31st January a detachment of two hundred men of the 11th Regiment, under Lieutenant Lloyd, marched into the hills west of Singhur.

It is necessary to state, that Government had now sanctioned the enlistment of a certain number of Sibundies for the Police of the district, to replace those who had moved off with their chiefs. Not one however of the inhabitants would enter our service, from the dread they had of Oomiah, although many acknowledged that they were almost starving, and greatly in want of employment by which they could earn a livelihood.

An intelligent man of the Ahmednuggur Police Corps, named Ram Singh, was employed with five other Sibundies to move about the country, to ascertain if possible who were the most active persons in aiding the gang, supplying them with food, conveying intelligence, and circulating false reports. This man having persuaded six active, stout koonbies (farmers) from the bank of the Neera to accompany him, moved to the eastward; and early on the morning of the 2d February (it had been raining heavily) he proceeded to a small wary (hamlet) a few miles from Goolinchy, under the impression that he should find a brother of Oomiah's and two or three men of the gang. They surrounded the hamlet, and Ram Singh and another man entered the principal house. He was immediately beset by the men and women of the family, but observing Oomiah, he rushed at him and laid hold of him; but with the assistance of the people of the house, and by his own exertions, Oomiah extricated himself, and rushed past a sepoy standing near the door. He then leaped over a low wall in front of the house, and turned round and made a cut at Ram Singh, but the latter luckily had his dhot-tur (the cloth worn round the body) rolled up in his hand, and received the blow on it: the cloth was cut entirely through. Oomiah now with the six or eight friends who had been with him in the wary, ran with all speed towards a ravine a few hundred yards distant, pursued by the Sibundies, when all of a sudden about thirty men sprung up from the ravine. These were the rest of his followers, who had taken shelter under the bushes from the rain. The



Sibundies were now obliged to discontinue the chase, and retired in the direction of the village of Moray. The gang seemed greatly alarmed, and ascended some rising ground near them, to discover if possible where the rest of the detachment was, for they concluded that these few men were only part of a large force close to them.

They bent their course towards the Neera, and moved rapidly into the Satara territory. Captain Luyken with a light detachment, and Subedar Luchmungeer with a detachment of the Ahmednuggur Police Corps, being in the vicinity, followed the gang, and pursued them into the hills southeast of Salpie. Oomiah at length met his friends Bhojajee, and Kristnajee here with about forty men. When at Mole on the 4th February, they drew up three proclamations, addressed to all the Ramoossy Naiks in the Satara territory, stating that with the concurrence of Government they, Oomiah Naik, and Bhojajee Naick Ramoossy, and and the Kolies and Dheres of the fort of Poorundur, called on them all to repair to the fort of Poorundur, &c. ; strongly recommending all of them to be of one mind, to act with unanimity, especially if they regarded the rights and emoluments which they enjoyed, \* &c. &c.

Oomiah with Kristnajee, Ram Row Koley, &c. concocted this production, and Ram Row acted as secretary on the occasion. They found it now difficult to remain above a day or two in the same place, owing to the activity of the detachments ; and as they had latterly suffered much from the want of food, they determined to return among their friends. A few hours, therefore, after they had dispatched these proclamations, (dated 5th February, 1832,) they set out for the Poorundur hills, halting near Walla, where they remained concealed during the day, and in the evening (of the 6th) they proceeded to Walla, plundered the Bunnyah's house there, and wounded a Dherc. The gang were in number about seventy at this time, (although reported to be nearly twice as many.) As they entered Walla, two men proceeded with all possible speed to Dhound, two miles distant, to give information to Jema-

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\* In the Ramoossy language it was written, " Be careful and keep all these matters quite secret from the Europeans ;" and it ends with imprecations.

dar Bheema of the 17th Regiment posted there. He instantly prepared his men, and moved off with his guides. The night was extremely dark and a high wind blowing. The Ramoossies with their plunder had quitted Walla, and were on their route to the Sakoordy hills when the detachment moving along was challenged. The Jemadar called out to know who they were, (with a view to ascertain if they were peaceable villagers;), in a few seconds two shots were fired, the balls passing over the sepoys' heads. All being satisfied that it must be the Bund, the detachment instantly returned the fire. After a few rounds the Jemadar wished to discover in what direction the Ramoossies had retired, as they had discontinued firing. The ground was very uneven, and covered with large black stones. As the men advanced they found the body of a Ramoossy that had been shot dead, and from subsequent information it appears that several others were wounded.

This unexpected encounter had a most powerful effect in our favour. It greatly disheartened the whole gang, and reduced their number to about thirty-five. The rest fled and never rejoined, many of them having thrown their arms into the prickly-pear bushes: several of them were seized in a few days after this. The Naik that was killed was a relation of Oomiah's and one of his most active adherents.\* Ram Row Koley took his departure with his Kolies. They proceeded north to Chamargoonday, and from thence to Punderpoor, and then towards Kolapoor. Captain Boyd was requested to move south in pursuit of them, and he seized them about the middle of March.

After this blow it was supposed that Oomiah would repair immediately to the jungles on the Poorundur hill; information however could not be communicated to the detachments to admit of their scouring the hills, till the morning of the 8th. The gang much alarmed, and most probably learning our intentions, only remained during the day in the hill, having quitted on the evening of the 7th. No troops could move from Sassoor, or indeed from any other place, when the gang was in the vicinity, without the circumstance being immediately announced to them by some one of their numerous friends.

*(To be Continued.)*

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\* This Naik and another relation of his, received twenty rupees monthly pay.

II.—On the Nuth Grass of the Ceded Districts.—By  
Robert Wight, M. D. Surgeon, 33d Regt. N. I.

To the Editor of the *Med. Lit. and Scientific Journal*.  
SIR,

When leaving Madras my attention was directed by Mr. Malcolmson to a particular kind of grass, known in the Ceded Districts under the name Nuth, or Nuthoo as it is often called by the natives, remarkable on account of the extreme difficulty of eradicating it, when it has once got possession of the soil. I have lately examined this grass, and, much to my surprise, found it undescribed, though a very common plant and one for the eradication of which, it appears probable, every successive government that has ruled in those districts has from time immemorial been paying large sums. This I hold to be one very strong proof, among many others that might be adduced, of how little the natural history of these very interesting provinces has been investigated, as this plant is a most conspicuous object, growing to the height of nearly four feet, and remarkable for its peculiar, I had almost said showy spikes of flowers; clothed as they are with much pure white hair, contrasting strongly with the very black ground in which they grow, which is rendered still more striking, by the foliage of the plant being of a pale whitish green colour, altogether different from the other plants with which it may happen to be associated.

So far as my acquaintance with the vegetation of that soil yet extends, it differs from nearly all the other herbacious plants found in it, in having very widely spreading perennial roots, or rather underground stems; all the others having either fibrous annual roots, or very long, tapering, perennial ones; with the stems even when procumbent, generally annual and altogether above ground.—In its creeping habit it resembles many of the plants found with equal constancy in sandy soil, among which similar creeping roots or under ground stems, form a valuable provision for binding the loose material among which they grow. Many such plants are found on the sand hills along the coast, and in Europe the *Triticum repens* is seldom wanting in such situations, and is as difficult to eradicate there as the Nuth is here.

This plant belongs to the genus *Ischæmum* of Linneus, but forms a species altogether distinct from any of those yet referred to that genus, at least in so far as I have been able to ascertain from specific characters. It certainly does not correspond with any of Roxburgh's descriptions of the Indian species.

For the sake of presenting a more perfect description of the whole plant, I shall give an extended generic character, but taken almost entirely from this species, and then add a very general description of the rest of the plant

*Ischæmum*—Lin., Brown, Kunth,

Spikes paired or digitate, linear, rachis jointed. Spikelets two flowered, two in each joint, one sessile the other pedicelled. Glumes (calyx) two, exterior one flat, interior boat shaped. Exterior sessile flower, male; interior hermaphrodite;—pedicelled spikelet the same. Paleæ (corolla) of all the flowers hyaline, interior one of the hermaphrodite florets, boat shaped, cleft at the apex, awned. Squamulæ two in each flower cuniate. Ovary free, smooth. Styles two, terminal. Stigmas plumose; hairs (when highly magnified) ciliate on the margin, undivided. Caryopsis (seed) oblong, smooth, free, exsulcate, enclosed within the persistent glumes and palid.

*Roots creeping, culms several from the same point, erect, simple, smooth, spikes hairy, jointed, separating at the joints: rachis and glumes ciliated and hairy.*

*I. pilosum*, repent, culms erect, simple, glabrous, leaves linear lanceolate, smooth on the edges, and on both sides; spikes several, rarely paired, erect; (4-6 inches long) rachis jointed, joints concave on one side, ciliated; glumes hairy, awnless; hermaphrodite flowers with a short contorted awn, male awnless.

Nuth or Nuthoo of the inhabitants.

HABITAT. Frequent about Bellary and the greater part of the Ceded Districts in "black cotton soil."

DESCRIPTION. Roots or underground stems diffuse, branched, spreading extensively in all directions, round, smooth, about the thickness of a goose quill, marked with numerous rings (not half an inch apart,) bearing the remains of scariosæ, sheathing leaves, from the axils of which, new shoots, and the true fibrous wiry roots spring. Pro-

per culms rising from the points of the roots that approach the surface, three or four together, and from two to four feet high, jointed, solid, about two thirds of the space between the joints, enclosed in the sheaths of the leaves. Leaves narrow, lanceolate, pointed, smooth, or slightly hispid, coriaceous, of a pale whitish green colour. Spikes linear, erect, 4-6, rarely a single pair, five or six inches long, clothed their whole length with white hair, but most abundant at the insertion of the flowers, rachis jointed, separating at the joints when ripe, with the persistent glumes and seeds attached. Spiklets springing from the joints, attachment lateral, glumes coriaceous, hairy, awnless, longer than the paleæ. Paleæ hyaline, usually all perfect, the interior ones of the fertile flowers somewhat boat shaped, cleft at the apex, and furnished from the middle of the back, with a short awn scarcely exceeding the glume. Seed cylindrical, tapering a little at the ends, glabrous, free, enclosed within the persistent glumes and paleæ.

The jointed fragile hairy rachis, and persistent spiklets, give this plant unusual facilities of scattering its seeds, which are so light as to be easily carried to considerable distances by the wind.

I have already mentioned, that it is probable that the successive rulers in these districts have, from time immemorial, been paying considerable sums for the destruction of this plant; less so perhaps now than formerly, from the long continued quiet they have enjoyed under the British sway, and the consequent high state of cultivation every where apparent in them. I draw this inference from the following document obligingly communicated by Mr. Lacon collector at Cuddapah, who caused several queries to be addressed to some of the neighbouring ryots, a translation of the answers to which, he gave me. The evidence afforded by that paper, seems clearly to prove the antiquity of the usages now in force for clearing *nuth-land*, and the amount of remission and cowle to be granted on that account; as yet apparently to little purpose, as the grass is still very abundant. Another circumstance leading to the same conclusion, is the adoption of terms expressive of the local extent of the evil, and indicating in a single word, the measures to be employed for its removal; since

it is well known, that such words usually originate in casual circumstances, or fanciful analogies, and require a long time before they become established as part of the language of the country in which they have originated.

*Queries and Answers, &c.*

1st Query.—In what land does the Nuth or long rooted grass grow?

Answer.—There are two kinds of Nuth one called Koondara in the *raguda* or black soil, the other Gurukor (*Panicum dactylon*, Lin.) in the *mudub* or mixed soil.

2d Query.—What is the loss sustained by it in each kind of soil?

Answer.—Even when the land can be ploughed between the spots of Nuth, the produce is affected by its presence. (The amount is not stated, probably is not known: no notice is taken of the second sort, which was scarcely necessary, as it is the common grass with long roots on which horses are constantly fed in this country.)

3d Query.—What measures are adopted for clearing it?

Answer.—Nuth is styled *pudava* (snip) when the large plough with 12 bullocks is required to eradicate it. When in detached spots it is styled *gumpa* (basket), and may be removed by wudas and other labourers with pick-axes.

4th Query.—What expense will it incur?

Answer.—The charge for digging out Nuth is from 1 to 1½ rupee for a piece of ground 8 yards long, 2 broad and 4½ deep. (This last dimension indicates the great depth to which it extends, and shows how difficult it must be to clear the land from such an encumbrance.)

5th Query.—In what proportion is cowle or remission granted?

Answer.—If the Nuth does not exceed one tenth of the land no cowle or remission is granted.

• If one fourth, the assessment on the Nuth

portion is remitted but no cowle granted. From one quarter to one half, besides the remission, a cowle is granted for clearing it; (see table).

**6th Query.** What remission has been made on the nuth?

**Answer.** No cowle has been given on account of Nuth of late years, but the remission granted on account of waste from Nuth in *fuzli* 1242, amounts to Rupees 163-7-2; viz. *gumpa nuth* Rupees 97 „ 11, *pudara nuth* 66-6-3.

**Observations.**—If there is any other kind of waste land belonging to a village, the ryots prefer bringing it into cultivation to the trouble of clearing Nuth. If not, and there is a demand for land the ryots will clear it without requiring cowle, hence there is little occasion for granting cowle.

| TABLE.<br>Shewing the amount of assessment remitted on cowle granted for clearing <i>nuth-land</i> .  |  | Supposed total rent of a piece of land. | Proportion of Nuth land to the whole piece. | Amount of rent deducted on account of Nuth. | Remaining rent of good land. | Of what is remitted as cowle. | Remaining collected for the Sircar. | Period during what cowle is granted. |
|---|--|---|---|---|------------------------------|-------------------------------|-------------------------------------|--------------------------------------|
|   |  | C. Pags                                 |   | C. Pags                                     | C. Pags                      | C. Pags                       | C. Pags                             | Yrs.                                 |
| If the <i>nuth-land</i> amounts to from 25 to 50 $\frac{1}{2}$ cent of the whole, the rent of <i>nuth-land</i> is remitted, and cowle granted if required, equal to half the rent remitted, from the cultivated land.                                   |  | 16                                      | $\frac{4}{16}$                              | 4   | 12                           | 2                             | 10                                  | 4                                    |
|   |  | 16                                      | $\frac{8}{16}$                              | 8   | 8                            | 4                             | 4                                   | 4                                    |
| If the Nuth amounts to from 50 to 75 $\frac{1}{2}$ cent of the whole, the rent of the <i>nuth-land</i> is remitted, and cowle granted equal to half the rent of the cultivated land.  |  | 16                                      | $\frac{9}{16}$                              | 9   | 7                            | 3 $\frac{1}{2}$               | 3 $\frac{1}{2}$                     | 4                                    |
|   |  | 16                                      | $\frac{11}{16}$                             | 11  | 5                            | 2 $\frac{1}{2}$               | 2 $\frac{1}{2}$                     | 4                                    |
| Should the <i>nuth-land</i> exceed 75 $\frac{1}{2}$ cent of the whole, and there being no other waste land attached to the village, the cowle of a large plough is required, the rent of 7-8th of the ploughable land is remitted as cowle for 5 years. |  | 16                                      | $\frac{12}{16}$                             | 12  | 4                            | 3 $\frac{1}{2}$               | $\frac{1}{2}$                       | 5                                    |

In the preceding observations I have endeavoured to make your readers acquainted with the existence of an evil probably unknown to most of them, and have no doubt, the sufferers will be most thankful for any hints for its removal, which those who take an interest in agricultural matters may be able to communicate. It is however necessary to a *lad*, that this grass has one important redeeming quality; cattle eat it, and large quantities are daily exposed for sale here, as food for them, and could it be raised in less valuable soil, it would, perhaps, be thought a useful enough plant: but growing as it does, in the finest land in the country, to the injury of every other, and possessing such facilities of extending itself, its total destruction would perhaps be an unalloyed benefit to the country. Before however coming to this conclusion and commencing a war of extermination, it would be necessary to ascertain its advantages as well as its disadvantages; whether on any occasion, it has been the means of saving the cattle of the country during dry seasons, by producing a regular crop when other less deeply rooting grasses had failed. If this has happened, it will be requisite in the first instance to provide a substitute, and then the sooner it is totally destroyed the better. Examining the matter in this way, we will perhaps be led to the discovery, before it is too late, that so far from being an unalloyed evil, that it is in fact a boon compared on these districts by the hand of a bountiful Providence, willing and doing all things for our good: knowing much better than we do, our real wants, and often conferring blessings, when we in our short sighted wisdom and philosophy, are repining at them as curses. Let us always bear in mind the well known example of the woodpeckers in the parks about London, that were doomed to unspairing destruction, as the destroyers of the trees, which, they were in truth, the most indefatigable enemies of the real destroyer; a caterpillar that was hatched in cracks and other decaying parts of the trees, thence, carrying destruction in all directions. A fact not discovered, until there was scarcely a woodpecker left, and then, only in consequence of the much more rapid decay of the trees after than before that event.

These remarks are not intended to prejudge the question



but are thrown out as hints, to induce those who may have the power, to weigh well in the first instance, the consequence of causing its total destruction, for there can be little doubt, that even that might be nearly accomplished in no very great number of years, if systematically attempted ; but once destroyed, it might be found even more difficult to replace than the woodpeckers ; when it was discovered that an injury in place of a benefit had resulted. Perhaps the natives are aware of this, and do not claim cowle so often as they might, lest they should be called upon effectually to destroy, what is to them a useful plant, but to the Government an expensive encumbrance.\*

I remain, Sir,  
Yours, &c.

BELLARY, 10th November, 1834.

ROBERT WIGHT.

\* Particulars of the Cowle to be granted for the cultivation of lands over grown with Nuth or long rooted grass (in the Bellary district) according to the General Orders issued by Colonel Munro, collector of the Ceded Districts in *pusly* 1215.

" 1. Particulars of the remission to be allowed for land which is over grown with Nuth to the extent of from  $\frac{1}{4}$  to  $\frac{1}{2}$ .

| EXAMPLE.   | Land.         | Survey<br>assessment. | Land.         | Survey<br>assessment. |
|--|---------------|-----------------------|---------------|-----------------------|
|  |               | C. P.                 |               | C. P.                 |
| Total amount of survey assessment.....}                                | 1             | 16                    | 1             | 16                    |
| Deduct land overgrown with this grass from the survey assessment.....} | $\frac{1}{4}$ | 4                     | $\frac{1}{4}$ | 8                     |
| Remaining cultivated land and survey assessment.....}                  | $\frac{3}{4}$ | 12                    | $\frac{3}{4}$ | 8                     |

This is the amount which should be paid to the Circar; for the trouble of rooting out the grass, one half of the survey assessment of the land overgrown with Nuths, is remitted in the same available amount. .... 2 4  
Leaving the remainder to be paid to the Circar.. 10 4

This indulgence should be continued for 4 years, and a full assessment of 16 Pagodas collected on the whole land from the 5th.

If the land overgrown with this grass is from  $\frac{1}{2}$  to  $\frac{11}{16}$ , the remission is to be granted as described in the following example.

|   | Land.          | Survey assessment. | Land.           | Survey assessment. |
|---|----------------|--------------------|-----------------|--------------------|
| Total survey assessment.....  | 1              | C. P.<br>16        | 1               | C. P.<br>16        |
| Deduct Nuths.....   | $\frac{9}{16}$ | 9                  | $\frac{11}{16}$ | 11                 |
| Remaining cultivated land...  | $\frac{7}{16}$ | 7                  | $\frac{5}{16}$  | 5                  |
| Deduct $\frac{1}{2}$ assessment of the cultivated land to be remitted for the trouble of rooting out this grass...) | ..             | 3 $\frac{1}{2}$    | ..              | 2 $\frac{1}{2}$    |
| Remaining amount to be collected .....  | ..             | 3 $\frac{1}{2}$    | ..              | 2 $\frac{1}{2}$    |

In a case in which the extent overgrown with Nuths exceeds  $\frac{1}{2}$  of the land, the remission to be granted is to be thus regulated.

|                              | Land.         | Survey assessment. |
|------------------------------|---------------|--------------------|
| Total survey assessment..... | 1             | C. P.<br>16        |
| Deduct Nuths. ....           | $\frac{1}{2}$ | 12                 |
| Remaining cultivation.....   | $\frac{1}{2}$ | 4                  |

This amount should be paid to the Circar. But if there is no other waste land in the village and a ryot request cowle for using a large plough to break down this grass, you will remit the said 4 pagodas, and collect at 5 C. fanams per plough, according to the condition of the cowkenamah for waste land.

Should the extent of Nuth be so far as  $\frac{13}{16}$  or  $\frac{14}{16}$  the same rule is to be observed.

You will give this cowle for villages in which there is no waste land, but you will not give it for villages in which there is such."

(A free translation of instructions to the native revenue officers.)

*To the Editor of the Madras Journal of Lit. and Science.*

SIR,

It having occurred to me once on a time that a collection of the lives of several of our Burmese and Talain subjects in the Tenasserim provinces taken down from *virâ voce* relation might be one means of making us better acquainted with their manners and habits, as well as the peculiarities of the Government under which they formerly served, I amused myself in noting down that of my Burmese teacher, a man truly characteristic of his nation, and whose name may be found quoted in the reports of the American Baptist Mission in Ava.

As our present subject, who merely speaks for himself through the medium of the English language, is well known to many who have served at Rangoon, and in our newly acquired province in Tenasserim, an account of the accidents which befel him by field and flood during the course of a long life, may not be uninteresting, and may perhaps induce others to pursue the idea which first gave rise to this production. In this spirit it is offered as a contribution to your Journal to occupy its pages in the absence of more valuable matter.

I have the honor to be, Sir,

Your most obedient servant,

A. M'CALLY, *Capt.*

MADRAS, 1st Nov. 1834.

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III.—*Autobiography of Tsuru Moun-Bo.*—By Captain Arthur M'Cally, 44th Regiment M. N. I.

I was born at Prome in the month of Gnyayon, the fifth day of the waxing of the moon, on saturday about sunrise, in the year \*1134. My mother, whose name was Maihla, was a Talain from the Pegue country. My father, Moun-Biau, whose ancestors lived in Motzobo, the birth place of Alompra was a Burman. He was in the service of Noun-daughee the eldest son of Alompra, and eventually received the office of †Toit-thooghee or Myothooghee of Prome from him after he became king, on which occasion

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\* A. D. 1773

† Chief civil officer of a district.

His Majesty gave him for a wife my mother, who with her sister had been taken prisoners in the war against Pegue carried on by Alompra, and had been presented to NOUNG-DAUGHEE the heir apparent; in whose palace they remained as Kolouks\* for two years.

My father was a clever man, and commenced teaching me to read and write as soon as I had attained the age of seven years. I continued my studies under him till I was twelve years of age, when he died, leaving my mother, an elder sister and myself. He had some property in slaves, cattle, ground &c. but Government demands to the amount of six thousand Tickals† of silver were brought against his estate. The property was sold to meet these demands, and did not prove sufficient. The Myowon ordered me to pay my father's debt, and to take upon myself his office. I pleaded inability in consequence of my youth, and my want of means. He sent me to Ava, to which place I was accompanied by my half-brother MOUNG-O. I was there presented to the ministers in the Klotdau‡ who offered me the situation left vacant by my father's death. I pleaded inability to fill it. The Ministers said, one of my elder relations should do the duty for me during my minority. They represented the circumstance to the King, who agreed that I was too young for the office, and therefore directed that my half-brother MOUNG-O should perform the duty in my name, and that I should always be seated in his lap when he was administering justice in the Goum.§

I returned to Prome, and lived with my mother, enjoying the fruits of the newly bestowed office for about one year. At this period my mother's younger sister who had been presented to the Toit-thooghee of Dalla, and had gone on business to Ava with her husband, was on her way back when she found her sister at Prome. After a most affectionate meeting, my mother formed the determination of quitting Prome, and retiring to her sister's house. Nothing of this was mentioned to me, but one night I was

\* Ladies of the palace.

† About 1½ Rupee is equal to a Tickal of silver.

‡ Principal hall of justice where the ministers sit in council.

§ Court of justice.

called away, hurried into a boat with many rowers, and carried with rapidity to Dalla. My mother left all her property behind except a few ornaments.

I lived in the district of Dalla quietly for about one year, at the expiration of which an insurrection broke out. In the year 1145, Gna-kontau and Gnasat who were Talains\* and the Paineens† of two royal boats headed the insurgents, attacked and carried Rangoon and kept possession of it for seven days. My aunt's husband the Toit-thoó-ghee of Dalla joined the insurgents. The royal army at last made its appearance, defeated the rebels, retook Rangoon, and apprehended a vast number of the insurgents of whom about three thousand were executed, and amongst them my uncle. A great many were burnt to death after the usual Burman custom. A house of bamboo trellis work, with a floor of the same description was built, under which a quantity of straw and gunpowder was placed; the criminals were bound hand and foot and put into this house. Neither age nor sex was spared;—it was sufficient to be connected by blood or marriage with a rebel to be deemed worthy of this cruel death. The guilty and innocent suffered alike. A train was laid to the powder, and on a signal given the whole were blown up.

In this insurrection I was accused of having had my share from the circumstance of my living with my uncle; but on explaining the manner in which I had been withdrawn from my office at Prome, I was, with great difficulty excused, with the confiscation, however, of all the property I possessed which left me in great distress. I repaired to Rangoon with my mother, whilst my aunt was ordered up to Ava.

My half-brother had been ordered down with a division of the royal army against the rebels, and found me out at Dalla. He wished me to return with him to Prome, but my mother resolved not to go, and I staid with her. My half-brother gave me fifty tickals of silver, and a Putzo‡ for my present necessities, and recommended me to a friend of his in Rangoon who employed me as a clerk.

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\* A race of people inhabiting Pegue.

† Literally helmsmen, people of some consequence in the Royal warboats.

‡ A man's cloth or dress;

From the emoluments of this office, I had to support my mother and eldest sister, and continued to exercise it for about one year, when my patron the Tsarai-daughee,\* on his being summoned to Ava, recommended me to Mougoin the Myothooghee of Zwaithabon who lived in Rangoon. My duty under this latter person was that of an agent. I had to attend at the Yuom, and receive the orders addressed to my master for the levy of money, men or other supplies. These orders I had to take to the Myotsarai,† an officer under my master and demand the amount of requisition from him. To give an example of the speculation which is prevalent amongst the Burmese officers of Government, I will mention that were the order for the levy of 100 tickals of silver from the district, the Myotsarai would levy from the inhabitants 110, of the additional 10, he would keep 5 to himself and give the other 5 to the Myothooghee. On my receiving the 100 tickals, I would proceed to the Yuom, and offer the first day 30 tickals as the whole sum I had been able to collect up to that period, promising to pay an equal sum the next day, on which I would take 30 tickals more, and promise to pay 20 the following day. The day after paying the 20 tickals, on being asked for the remainder, I would declare the impossibility of obtaining any more; that much difficulty had been experienced in collecting what I had given in. On this I should be seized, tied by the arms and exposed in the sun. I would then promise to produce the money the next day, and should be released, but failure produced a similar punishment; at last if I could stand out for some days this kind of treatment, it would be taken for granted that I could not collect any more, and the sum to be levied would be rated at 80 tickals. The 20 tickals which I had obtained in this way, I would divide with the Myothooghee. This is a common practice, no shame is attached to it, I had no salary, and was obliged to pay myself in this way.

I continued in office under the Zwaithabon Myothooghee for about one year and a half, at which period I had

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\* Royal secretary.

† A district writer or secretary.

amassed a little money and employing it advantageously in the purchase of paddy at the rate of five tickals per hundred baskets, I was enabled when the royal army marched to Martaban, and the price of paddy rose in consequence to 30 tickals per 100 baskets,\* to realize a handsome profit of about 1,000 tickals of silver.

I was now about seventeen years of age, and being anxious to commence my noviciate in a monastery, I proposed it to my mother, and obtained her consent to my becoming a *Shenpier*.† I delivered the whole of my gains to my mother for her support and was received after the usual ceremony into the monastery of Kenghee Bouai. Here I studied the following works, viz. the four ‡Peetza-wek-kana, ‡Kandaka, ‡Theekeea, ‡Lointsaiba, ‡Dantsaiba, ‡Puraikee, ‡four Brama-sozas, &c. all connected with my rank in the monastery. I afterwards studied ‡Zat-tsaisoung. In this monastery I remained about one year, and then proceeded to Prome to pursue my studies. There I entered the monastery of Ruhan Tsaradaughee Gnawen, and continued in it for six months during which time I read "Thada-sheet-soung." The Tsaradaughee was very old, and I expressed myself desirous of quitting for fear of giving him trouble, he kindly insisted on my going to Oonanda one of his disciples who lived at Lettat-pyeen about three Dóings§ from Prome. On arriving there I found the village small, the number of Ruhans,|| probationers and other orders of the monastery numerous, and provisions scarce. I continued my studies in Thuda-sheet-soung, but I was so inquisitive, and my zeal for learning caused me to make so many references to the Ruhan that he complained of not being able to attend his other disciples and answer my questions too; under these circumstances I thought it advisable to proceed elsewhere in hopes of finding a teacher who had more leisure to attend to

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\* A basket contains from 30 to 32 Arcot seers.

† A noviciate. Youths generally enter the monasteries as such for their education, shave their heads, and wear the priest's cloth.

‡ Works on Ethics, Theology, Logic, &c.

§ A Dóing is about 2 English miles.

|| Ruhan is an order of priesthood.

my wants. I returned to Prome, where my half-brother Moun-O was still exercising the office of Toit-thoo-ghce, he received me kindly, and recommended me to go to Pandonghma Ponghee, who had his monastery in the village of Poghan near Prome. With this person I sojourned nearly six months. I found him, however, a man of very limited acquirements, but with modesty sufficient to tell me that he was incapable of adding to my stock of learning. I represented this circumstance to my half-brother and afterwards took my departure for Amrapoora and entered the monastery of Bhagya Tsaradau, a man of learning and staid there two years. With him I studied \*Thuda-sheetsoung, \*Weence, \*Shengyo, \*Bedeem, &c. At the end of this period I renounced the priest's garb, and entered the service of the King's son the Piemen or prince of Prome, as a Loo-bioo-dau or personal follower. I was appointed to teach the young princess Senbiumai to read and write.

This person had many young ladies as companions, all of whom at the same time received instruction from me. I proceeded to the ladies' apartments in the prince's palace daily at eight o'clock in the morning, and was ushered into an open verandah, where the princess and her ladies were seated on carpets. Cushions raised somewhat higher than the rest in compliment to my office of tutor were placed for me. Here I had a difficult task to perform. The young ladies who were from eight to fifteen years of age, were full of spirit, careless of the arrangement of their dress, and the postures in which they placed themselves. I was a young man, little more than twenty years of age, and subject to all the temptations which surround that age, but a word said, or a look conveyed to give rise to the slightest suspicion that I had formed an attachment for any one of these young ladies, or that I had taken any liberty with them would have cost me my head. I was the only male person in their society, and this circumstance seemed to have banished from my fair pupils all restraint. In this manner I was employed for more than a twelvemonth.



The Piemen my master re-established me in my situation of Toit-thooghee of Prome. My half-brother continued to act for me, but I received the principal part of the emoluments. The prince was some months afterwards called to Amrapoora by the King, and I accompanied him.

In the year 1152, I took orders as a Ruhan in the monastery of Moun-g-doung the Isaradaughee where I remained for three years. At my solicitation, I was permitted by the Isaradaughee to visit my mother at Rangoon. At this time I commenced studying the Talain language in the different monasteries about Rangoon and Pegue. I was engaged by the Dalla Myothooghee to superintend the building of a monastery in his district, and after the completion of it took orders as a \*Poggo. In this new monastery I staid one year. I afterwards repaired to a monastery at Syriam where I remained some months and then went to Martaban. At the end of about three months residence at this latter place, I again renounced the priest's garb and betook myself to secular employment. \*

There was a friend of mine in Martaban a Tara-thooghee or advocate with whom I lived. From him I borrowed two hundred tickals of silver and turned merchant. I purchased merchandize of various descriptions, and proceeded to the Thoung-yeen river which falls into the Salween. Here I met with a Isaukai or chief of Kariens with whom I intended to carry on my speculations, and we accordingly performed the ceremony of "Tswaithouk" or drinking each others blood. As this is a singular ceremony I will describe it.

It is a custom amongst certain tribes of Kariens, † in order to assure themselves of the fidelity, and fair dealing of those with whom they are about to transact business, that the contracting parties, in the presence of the assembled villagers, should each prick the fore-finger of his right hand with a needle, so as to draw blood. The finger is then held over a small vessel of water and the drop of blood is allowed to fall into it. If the drop diffuses itself immediately in

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\* Poggo a high order of priesthood.

† Kariens a race supposed to be the aborigines of the country, chiefly reside on hills and woody tracts.

the water, the faith of the person is impeached; but if it retains its globulär form, it is a good omen, and the parties drink the blood thus dropped, each drinking the blood of the other.

After performing this ceremony satisfactorily, I was entertained and fed by the Kariens. I delivered all my merchandize to the Isaukai to dispose of according to his discretion. This investment of merchandize was received as a present, and divided by the chief amongst his followers who amounted to about five hundred and lived all in one house or barrack. I was entertained by them for about twenty days, when I expressed my intention of returning. The Isaukai communicated this to his followers, and called on them to return to me as a present some of the produce of their forests equal in value to what each had received. Some gave a proportion of elephant's teeth, others bee's wax, &c. The Kariens I allude to were subjects of the Zammai Tsaubwa, and the penalty of visiting them was great. I was therefore obliged to return cautiously at night to prevent discovery. I dared not enter Martaban with my boat, I concealed it in a creek near the town called Dawaikoun. I went myself to Martaban, and communicated my success to my friend. I found an opportunity soon of disposing of my goods to a Chinese junk\* which was in the river. I had only taken up goods to the amount of two hundred tickals, and my return cargo brought me fifteen hundred tickals of silver.

In those days there were numerous large and populous villages in the province of Martaban. The Talains had not yet rebelled. I made an advantageous speculation in paddy. I purchased early in the season a large quantity at 7 tickals, per 100 baskets, and at the latter end of the season when it became dearer, I sold it at 16 tickals per 100 baskets. I went to Yë, where I built a large boat, brought it to Martaban, and lading it with rice and glazed jars, despatched it with a fleet of six other boats under charge of my nephew to Penang for the purpose of trade. I accompanied the fleet as far as Yë, where I stopped. On our way thither, we encountered violent winds from the east, which obliged

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\* Junk, a Chinese trading vessel.

us to take shelter in the island of Callagouk. It was on this island, that, at the suggestion of Mounghoeyai a rich person who was with us, we set to work, and dug a well, and planted it round with cocoanut and beetle-nut trees. This well is the same which I visited in company with some English officers a short time ago. I had not been there for 20 years, but recognized the spot, few of the trees we planted remained, and the sea had made great advances on the island so as to threaten a speedy destruction of the well which at present is in good order and yields abundance of good water. We staid here three days and then took our depature for Yë. At Yë I remained and speculated in the building of boats.

On the return of my boat from Penang to Yë in the month of Pyatho 1170, the Doinwon's\* army had reached Martaban, and he had issued an order that no boats should leave any of the ports without his permission, accordingly my boat was detained at Yë, until the arrival of the Doinwon there, with an army consisting, as was generally supposed of 30,000 men. I petitioned him for the release of my boat, and offered him a present of 15 tickals of gold which he would not receive, but directed me to hold my boat in readiness to convey some of the sick of the army to Tavoy, after which, I was told, I might return. I conveyed forty soldiers in my boat to Tavoy where in common with many others I was obliged to anchor in the harbour at the entrance of the river where I found several other boats full of soldiers. Seven or eight days after reaching Tavoy, the Doinwon arrived there with his army by land. We were then ordered up the river, and the troops we had on board were disembarked. An account of our cargoes was demanded. On giving in mine, the Doinwon directed me to land the articles and deliver them up to him, saying, he would purchase the whole; this was done to all the other boats also which had come from Penang. After going through the formality of taking the account, and the delivery of the articles, the Doinwon ordered the crews of all the five boats to be seized and have the létoik

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\* Doinwon the title of the Burmese general entrusted with the expeditio n

or neck stock applied to them, on the plea that they had no right to go to Penang to trade. I never afterwards received any payment for my goods.

We remained in confinement for about one month, when it was ordered, that we should again be put in our boats, our legs in irons and be sent to Mergui; this was done and the soldiers rowed the boats. On arriving there I obtained my personal liberty by making a present to the officer on board the boat of a ring which I had caused to be purchased at Penang for 80 dollars.

The Doinwon's Tsikkai or Lieutenant was at Mergui. He had been an acquaintance of mine at Amrapoora, and I remained under his protection for about 15 days when he directed me to proceed with my boat to Martaban to make some purchases for him. The Tsikkai told me that the Doinwon had ordered that some one should be deputed to demand the completion of the levies of troops from Dalla, Rangoon, Pantano, Syream and Donabew and that I must proceed under another officer on that duty. It was now the rainy season, the month of Gnayon. Nine boats started from Mergui; every one of which was wrecked. I never heard of any part of their crews being saved, except six men of my own boat which was wrecked near the river Guwai in the neighbourhood of Bapain. The boat struck on a sand about 4 o'clock in the morning and we had just time to seize a few oars and other spars to enable us to keep afloat. Two others and myself tied an oar and one of the masts of the boat together, and by this means after floating about all day, reached the shore just before sunset; we were almost exhausted and did not find any others of our companions till the next morning, when we discovered three more, as we were going along the shore.

We had nothing to eat with us and had recourse to the fruit of the Neepal palm to allay our hunger. Two of us had saved our putzos which being torn up and divided amongst us afforded just sufficient covering for decency. We spent two days and nights, wandering along the uninhabited and inhospitable coast, constantly annoyed by myriads of musquitoes, which deprived us of all rest. We at length arrived at an encampment of motzos or hunters by whom we

were treated kindly and fed for three days, after which they took us to the residence of their families in the jungle. Their houses were built on trees ; they inhabited the jungle for years without going to any town or seeing any person out of their own society, and were so desirous to continue this secluded life, that when we took our departure, they made us swear that we would not disclose this place of their abode. They gave us a boat, and information as to the route we were to pursue towards the neighbouring Kariens. We accordingly left them and after one day's journey reached the Karien village, where there was a monastery into which we were received, well fed, and clothed. Here we remained about one month, after which I accompanied one of the Ponghees\* towards Rangoon, but not daring to enter that town for fear of being apprehended as a deserter from the Doimwon's army, I went to Panslang, and there remained till I thought it safe to return to Rangoon whither I at length went, and met my mother and sister. My half brother was a Padazo† in the service of Myedaimen or Prince of Meeaidai, and informed his master of my arrival. I was summoned to his presence, and having related my story, I was appointed by him to act as Oukpanyai or writer to keep the roster of the night-guard which mounted at the Prince's. With the Myaidaimen I remained a twelve month when I was deputed by him to Amrapoora with presents to the king and other members of the royal family. On delivering the presents I saw amongst others the Piemen who recognized me and asked me what had become of me since I left the monastery, and why I did not come to him. His Royal Highness ordered me to stay at Amrapoora, and said he would write to the Myedaimen about me. I staid with the Prince about six months, after which he ordered me to Rangoon to fill the situation of ‡ Atsoo-yai to his Royal Highness's men, about 800 in number.

About this time 1174, His Majesty Moun-gwoin having consulted certain prophecies in some ancient books and learning by them that his kingdom was to be overturn-

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\* Priests.

† Padazo, a sort of butler or majordomo

‡ A sort of muster master.

ed by rebellion, did for the purpose of ensuring the fidelity of his subjects issue a royal edict, that all the twelve different orders of royal servants, viz. elephanteers, cavalry, shieldmen, golden spearsmen, silver spearsmen, musketeers, cultivators of royal land, kulabin or corps of foreigners, Feringhee musketeers, Pwaabet-yan, &c. &c. should send their male children from five to twelve years of age to the capital to be organized in corps. \* Above 40,000 of these children were collected. They were each marked by tattooing on the shoulders; one shoulder bore the effigy of kyenthai, the other of the To (particular animals). The preparation for tattooing was said to be an antidote to bruises or blows. These children were called kyagles (or young tigers) from the circumstance of the King having been born on a monday and the kya or tiger being the corresponding representation of the planet moon. I was appointed to the charge of 1,500 of these children of whom none were above the age of 12. They received from the Royal granary each one basket of paddy per month; and every ten days three small copper coins to buy other articles of food with. In consequence of the tender age of these children which rendered it necessary to hire people to beat out the paddy, there did not remain sufficient for their sustenance, and they were reduced to a state of starvation. On a representation to the King, his Majesty ordered the supply of Paddy to be increased to two baskets each monthly, and that they should each receive two ticks of Dine silver per month for their bazar expenses; this money however was not entrusted to me or any body else who might have taken care of it, but it was given to the akiats the lowest rank of officers commanding parties of 10 boys. These akiats were themselves boys, the consequence of which was that as soon as the money was paid it was quickly dissipated in trash, and till the next payment the boys were obliged to resort to the tanks in the neighbourhood and procure for food the shell fish with which they abound. This had an injurious effect on their health, and the Cholera morbus attacking them killed a vast number of them. Many hundreds died daily and of the 40,000 scarcely half that number survived.

Not liking this state of things, I took an opportunity of absconding clandestinely to Rangoon, but I was pursued and apprehended there, and brought back to Amrapoora where I was imprisoned for one month. From this state I was released through the intercession of the Piemen's son-in-law who employed me in purchasing paddy for him in the lower provinces. On my return to Ava, I solicited the appointment of Atsee-een to the Mee-awaddee and Piemen's men at Rangoon which I obtained ; but so many exclusive privileges were attached to the office and it gave such great offence to the Myaidemen who was Myowon of Rangoon, that he used his influence to have it cancelled, in which he succeeded.

Whilst this was taking place the present King's grandfather who was on the throne was taken very ill, and the heir to the throne, the present King took upon himself a kind of Regency. He summoned the Piemen his uncle, and the Toungoo-men and their principal officers to court by order of the King, but when they arrived he demanded of them to state their sentiments of loyalty to himself. They all represented that the king was still living, and to him alone they owed allegiance. On this they were confined in prison.

When the king died, the present king ascended the throne, and one of his first acts was to have the Toungoomen's neck broken, his body put into a large jar, and thrown into the Irrawaddy.

The Piemen was also murdered by a secret and different process. The jailor was frequently questioned whether the Prince was dead, and he was handsomely fee'd ; he took the hint, and after strangling the unfortunate Prince reported his death in prison as an ordinary occurrence.

The present king also caused twelve of his uncles to have their necks broken, and murdered many more officers suspected of being unloyal.

I was fortunate in not going to Amrapoora, for if I had, I should certainly have lost my life along with the others.

About this time Shukeen-Moung-moo, a relation of the present King's grandfather, was appointed Myowon\* of Martaban. I went to him with some pre-

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\* Governor of a province.

sents, and he expressed\* his surprize at seeing me, and congratulated me on having escaped the fate that seemed so unavoidable ; told me the " fire was not yet quenched," and advised me to accompany him to Martaban which I did, and was appointed by him to act for the Myo-ok,\* of Durè in the island of Belew during the absence of that officer at court. Thukeen MOUNG-moo had been sent to Martaban to supersede MOUNG-tsai, or Thumoin Broo, who had got into disgrace in consequence of not proceeding to court when ordered to do so on the death of the king. He was directed to be seized, but he fled to Rangoon, where eventually he was apprehended.

At the end of five months I was relieved from my temporary office of Myo-ok of Durè by the return of the Myothooghec, and took up my residence again in Martaban. Shortly after this an army of about 10,000 men with the Sekkiä-won as commander-in-chief, and Menghee Oozina lieutenant general commanding the van arrived at Martaban. The Sekkia-won made his head quarters there, whilst Menghee Oozina was despatched with the advanced division consisting of 3,500 men to Azimee up the Atrau river. This took place in the year 1183 about the month of Natdau. A stockade was erected at Azimee, and I employed myself in carrying provisions to the army from Martaban.

The object of this expedition was to seize and secure any of the Siamese who might quit their country through dread of the cholera morbus which was raging amongst them. A very exaggerated account of this dreadful scourge had been carried to the king of Ava from Tavoy, and it was said that the king of Siam had lost two of his queens by the disease, and was so terrified, that he had quitted his palace, and became a wanderer from monastery to monastery.

This force continued as an army of observation till the month of Thudeergyot, and the only affair of arms which took place during its occupation of Azimee was the attack on Kutoinzoin stockade, the advanced post of the Siamese, by the troops of Menghee Oozina. The garrison

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\* Chief of a district.



fled on the first assault, and after pillaging the place the Burmese troops retired immediately to their position at Azimee. Menghee Oozina was at this time about 65 years of age, a tall thin man, about 6 feet high, fair complexioned for a Burman—Greyhaired and nearly bald, and his countenance flushed by the excessive use of spirituous liquors. He was a great consumer of beetle-leaf and nut, and from the great use of these stimulants the sensitiveness of his palate had become so much injured that he was obliged to use the most stimulating food procurable. His cooks could not suit his taste sufficiently in the dishes which they prepared for him, and he took into his head the whim of endeavouring to remedy the defect by dressing his own victuals.

He used to put a most extraordinary quantity of chillies, Gnapee,\* and salt into his food, so as to render it quite intolerable to the tastes of others. He was a man of exceedingly cruel disposition. I once saw an instance of it. He had ordered his cook to be flogged with a rattan till he nearly died, because he had lost three Marantees† entrusted to his charge, fruit of no value at the time. I had in my possession some very fine fruit of the same description, and whilst the cook was undergoing this cruel flagellation, I presented my fruit to Menghee Oozina, and with great difficulty begged the cook off.

The advance under Oozina returned to Martaban in the month of Thudeengyat, and the Sekkiawoon after establishing Oozina as Myowon of that place took his departure for the capital.

On the breaking up of the army, I conveyed some of Yé-won Mounkoing's soldiers in my boat to Rangoon, and continued my mercantile pursuits there, trading up the river Irrawaddy as far as Prome, Myaide, and the neighbourhood.

In the year 1184 an army under command of Tsara-wonghee Moungnai, with Bundoola as Lieutenant General marched against Cussay to quell an insurrection there, which object being effected, the army was directed against Assam in 1185 to quell a rebellion in that country.

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\* A preparation of fish, sometimes extremely offensive to the smell.

† A fruit of the mangoe species.

Tsara-wonghee Moungnai is said to have died on his return towards Ava from the latter expedition. No levies were drawn from the country below Prome for this army. This same year Bundoola offering his services to the King to conquer Chittagong was despatched with an army for that purpose. In the month of Taboung orders came from Ava to prepare for an attack by the English. Bundoola, when the quarrel took place with the English on the Chittagong frontier wrote to say that he had information of an armament consisting of 47 sail of vessels having been fitted out with the intention of making a descent on Rangoon. Great activity prevailed in fitting Rangoon for the attack. Defences were thrown up along the river side. News had reached Rangoon of the success of Bundoola on the Chittagong frontier, and as it was greatly exaggerated, the Burmese did not expect before this, that the English would come to Rangoon. The town however was surprized on the 14th day of the waxing of the moon in the month Kutzon, by the appearance of a large fleet sailing up the river. I had been ordered to superintend about 160 men in throwing up a parapet of earth on the eastern side of the town near a creek close to which was a white washed wooden house built for Ambassadors, and which has since been burnt.

The Gai-Tsikkai was the first who arrived with news that a vast number of vessels were at the mouth of the river supposed to be English, and duly reported the circumstance to the Gai-wons\* at Rangoon, they said to him "Why are you come to alarm the people of Rangoon to no purpose, and without cause?" and put him immediately in confinement. Tsikkai† Mounplat was despatched by them on the instant to ascertain if the Gai-Tsikkai's story was true. Having proceeded down the river the Tsikkai Mounplat slept at the chokey during the night, and the next morning went in one of his boats to the first vessel. He was received on board kindly and fed, and on his departure was commissioned to deliver a packet to the authorities at Rangoon. Tsikkai Mounplat arrived at Ran-

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\* Officers of the marine department.

† Tsikkai, deputy or lieutenant.

goon about sunset and delivered his packet to the Gai-wons excusing himself from attending, on account of not having had his dinner. The packet was broken open and by the light of a solitary wax candle the four Gai-wons each chose one of the eight papers which the packet contained—Tsikkai Mounghno took one, Gnakan Mounghbai took another. Tsaraighee Mounghshoe took a third. I was all this time close to the upper stage of the Goum where the officers of government were collected. They commenced reading to themselves the contents of the papers by this solitary light, and every now and then I could observe they shook their heads. At last Gai-won Moungh Bo said “it is not a subject to be kept secret, every body should know it.” The Gountsarai was called and the document read aloud. It turned out to be a proclamation from Major Canning. Messrs. Turner, Wade, Sarkis and Aratoon, besides many other merchants were sent for, and asked their opinion as to the expected result of the proclamation. They, most of them said that the vessels were not come with any hostile purpose but merely to negotiate on the subject of Bundoola having committed aggressions on the Chittagong frontier.

The Gai-wons would not believe this and had all the kulas† imprisoned in the Goum.

There was an immense crowd round the Goum. None of the people would believe that 40 or 50 vessels had arrived for the purpose of negotiation, and expressed their opinion to that effect loudly. The Gai-wons immediately set about to call on the different Thooghees and Gaons of districts to furnish their quota of men; tied many of them up, and used threats. I was employed the whole night with the men under me throwing up a parapet; the next day about one o'clock the ships came up the river, and then commenced the cannonade on the town, at which all the chiefs and their people fled from the place. I also went off to Pusandown where my house was. There I advised my friends to betake themselves to their boats, and fly up the river which they did. I remained in my house to look after my property. I had a quantity of beetle, nut, oil, to-

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\* Foreigners.

bacco, gnapee and fish, neepa leaves, rattan, &c. in value about 2,500 tickals, which I could not convey away. I slept that night in the village; the next morning an English officer with some seapoys came to the village, they were accompanied by a Burman mussulman as interpreter. They asked me who I was and telling them I was a merchant and showing my property, they asked for the women, I said they had fled. The officer told me to go and call them, that they had no reason to be afraid, no harm would be done to them. When the officer went away, I got into a small canoe with my attendants, and started up the river. The alarm was so great amongst the people, there was no possibility of persuading any of them to return, nor did I return myself but left my property to the mercy of the invaders. About 300 boats full of the poorer families, had assembled at Kureenzoik about half a tides journey up the Moyoit branch of the river. Decoits were in great number, but by dint of watching we managed to keep our party pretty clear of them; we staid at this place about 15 days. Near it was established the stockade of Yaigoo or Gnounge-woin, and for the building of which our party had to furnish the materials; the stockade was attacked by the English and taken, I went to see it after the troops had returned to Rangoon, and found about 300 bodies, principally those of Setoung people in it. The English force passed close to our position, but of course they knew not that we were there, or they would have endeavoured to secure our numerous families. We were called on again to rebuild the stockade, but whilst engaged in it, many of the families who were with me fled in their boats daily, and seeing this I thought it prudent to decamp myself to the village of Kobiat three doings to the east of Pegue. I had not been there above ten days when the Oukmawon or officer of Decoy elephants came with an army of 3,000 men from Tounjoo, on his march to Rangoon. He commenced seizing all the boats he could lay hands on, and I therefore concealed myself with my boats, in the neighbouring jungles or long grass which was flooded sufficiently to allow our boats about 20, or 30 in number to traverse it, and afforded excellent means of concealment. After being cer-

tain that the Oukmawon had passed with his army, we again returned to the village of Kobiât. We found the place however too much in the line of march for the different bodies of troops passing to and fro, and therefore moved off to the village of Kaloin about one degree to the east of Kobiât, and remained there during the rest of the rainy season.

Here our autobiographer does well to keep silence. When the Burmese population had recovered its panic, he was one of the first to enlist on the strongest side, and took office under the British authorities at Rangoon, but the deeprooted habits of the Burman came so frequently in collision with the British exercise of justice, that he was sometimes very unpleasantly situated. He has for the last eight years been resident at Moulmein during which period he once visited Madras, he is considered one of the most erudite of his class, but retains too much of his Burmese character to hope for any employment except in the department of literature.

IV.—*Observations on the return of Halley's Comet.*—By  
T. G. TAYLOR, Esq. *Honorable Company's Astronomer.*

*To the Editor of the Madras Journal of Lit. and Science.*

DEAR SIR,

The return of Halley's comet which may be expected towards the latter end of August next, is an event to which I apprehend every class of observers looks forward with interest, under this impression I have thought that the accompanying sketch of the heavens for the latitude of Madras, on the 1st September, at 4 o'clock in the morning (the time at which it will be proper to look for the comet) will prove acceptable; the sketch exhibits the apparent path of the comet from the 7th August to the 2d October after which time it will probably not be seen again till the 12th or 13th, it having in the interim (on or about the 7th) arrived at the nearest approach to the earth; (21 millions of miles)—with regard to the probable accuracy of these predictions it is but fair to state, that the place of the comet may possibly differ two or three degrees from the computa-

tion, and the dates may be two or three days too early or too late; circumstances which arise from our almost total want of knowledge of the constitution of this comet, and from the long period (76 years) during which it remains invisible.

The first observations which enable us to identify this comet were made in the year 1456, since which time it has already returned four times, viz. in 1531, 1607, 1682, and 1759; from the present highly advanced and rapidly advancing state of Astronomical Science, and the superior excellence of the instruments which will on the present occasion watch its motions; we may venture to expect, that the observers of the next century (in 1912 when it will have completed another revolution) will be enabled to predict its place with as much certainty as we now can that of the Sun or Moon.

Very sincerely yours,

T. G. TAYLOR,

*H. C. Astronomer.*

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V.—*Observations on the Planet Jupiter, &c.—By*  
T. G. TAYLOR, Esq. *Honorable Company's Astronomer.*

*To the Editor of the Madras Journal of Lit. and Science.*

MY DEAR SIR,

I beg to forward for insertion in the Madras Journal of Literature and Science, the particulars of my observations of the occultation of 50 Tauri and the planet Jupiter by the Moon on the evening of the 6th instant: the unfrequency of phenomena of this nature has I hope induced some of your correspondents to make similar observations, in which case the favor of their communication through the medium of your Journal or otherwise will by me be very thankfully welcomed; the observations made at this Observatory are as follows.

*March 6, 1835.*—Occultation of 50 Tauri behind the Moon's dark limb at 9h. 19m. 11.06s. disappearance instantaneous; observed with 5 feet Achromatic power CO.

*March 6, 1835.*—Occultation of Jupiter by the Moon's dark limb.

|                  |           |           |       |   |   |   |
|------------------|-----------|-----------|-------|---|---|---|
| <i>h.</i>        | <i>m.</i> | <i>s.</i> |       |   | { | The Moon's border had slightly im-<br>pinged upon the limb of the planet.   |
| At 10            | 6         | 40        | M. T. |   |   |   |
| At 10            | 7         | 7         | —     | — | { | The Moon's border as well as I could<br>judge had reached the centre of the Pla-<br>net, but the figure of the latter was so dis-<br>torted that the observation cannot be de-<br>pended upon to 5 seconds. |
| At 10            | 8         | 17.88     | —     | — |   |   |
| Barometer.....   |           |           |       |   | { | The Planet was totally occulted, obser-<br>vation correct to one tenth of a second.   |
| Thermometer..... |           |           |       |   |   | 30.118—light breeze from the S. E. air<br>hazy.   |
| Wet bulb do..... |           |           |       |   |   | 81.2<br>76.8  |

During the latter part of the observation the distortion continued, exhibiting at 5 seconds before the total occultation a thread of light three quarters of the diameter of the planet in length and much more obtuse at the apex than the ordinary figure of Jupiter.

The occultation of the 4th Satellite for which I very carefully watched, could not be observed in consequence of its extreme faintness; when within  $1^m$  or  $2^m$  of the Moon's border it several times disappeared altogether, and after 3 or 4 seconds again became distinctly visible, the other Satellites during these intervals did not undergo the slightest change in brilliancy, but on arriving within  $2^m$  or  $3^m$  of the Moon's border the same phenomena occurred.

The attention of Astronomers has of late years been particularly directed to the observation of planetary occultations from a desire to satisfy doubts which at present exist with regard to the lunar atmosphere; from the above observations it appears highly probable that the Moon is surrounded by an atmosphere, and that its extent is not less than that of our Earth's: the nature of the observation however (which is prolonged only during a few seconds) leaving no time for consideration or measurement, will necessarily for a long time to come leave us in doubt on this head, in the mean time

I beg to remain,

very sincerely yours,

T. G. TAYLOR,

*H. C. Astronomer.*

MADRAS OBSERVATORY, 14th March, 1835.

We published in a former number the prospectus of an association which had been formed at the Cape of Good Hope for exploring central Africa, and we have now much pleasure in laying before our readers the instructions addressed to the Director of the expedition, which are stated to be from the pen of the celebrated Astronomer Sir John Herschell.—Ed.

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VI.—INSTRUCTIONS ADDRESSED TO THE DIRECTOR OF THE  
EXPEDITION INTO CENTRAL AFRICA.

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*To Dr. ANDREW SMITH, (or the) Director (for the time being) of the Expedition into Central Africa.*

SIR,—In offering to you certain general instructions for the purpose of elucidating their views as to the object and conduct of the enterprise committed to your direction, the Committee of Management take the earliest opportunity of expressing their confident reliance on your zeal, talents, and experience, as of themselves enabling you to apprehend and provide for the proper object and most beneficial detail in such an undertaking, and they therefore expect that you should not consider yourself bound by any decision of theirs, to adopt or reject, in deference to their opinion, any measures of which their views at present do not coincide with the judgment you may be led to form in your progress. • •

They feel certain, moreover, that any measure which you may conceive it necessary to adopt amid the unforeseen occurrences of this enterprize, will meet with approbation from the Shareholders. As, however, amid the incidents to be considered and provided for as contingent, the expedition may be deprived of your services, it is the wish of the Committee that the intention and the proper course of proceeding, as far as such can be determined at present, should be defined and rendered familiar to the parties composing the expedition.

It is to be hoped that this may be only the first of a series of efforts prosecuted by the same means, and deriving their support from the same sources, but the fulfilment of this expectation must evidently depend in a great degree on its success. We cannot expect that our limited Colonial Society should feel justified in supporting any measure tending to sacrifice its valuable members and waste its resources, for objects solely of contingent and distant benefit, should it happen that the consequences of this endeavour confirm the impression of peril attendant on the view generally taken of it. However wide and promising therefore may be the views of benefit we entertain as about to arise from the knowledge we may gather, or the means and sources of commercial and scientific enterprise which the



expedition may unveil, these views must be held in subservience to the recollection that the unimpeded progress and absolute safety of this one is of paramount importance as a guide, model, and inducement to others : this, therefore, is ever to be kept in view, and first considered in all its undertakings, and any measure obviously unsafe, even though its advantages, supposing it successful, should seem to be many and eminent, ought to be carefully avoided. While our failure would by its effects on society here, necessarily damp our prospects of future benefit, it is to be apprehended that it would also have a disastrous influence on the natives to be visited. Even disaster from natural causes might diminish the impression of European skill and power ; and acting on the excited superstition of the savage might quench his desire for our intercourse ; and should it arise from the rapacious ferocity of the native tribes it would erect a more serious obstacle to future progress in their gratified appetite for plunder and their jealousy of retaliation. These views should inspire especial caution in regard to every proceeding, or even verbal enquiry among tribes where it is to be suspected that such lamentable incidents have already occurred. The impression of its safe advance and return, and of any benefits it may confer on those whom it visits, will unquestionably proceed far in advance of its presence, and necessarily subdue or weaken those obstacles which may at present restrain its proceedings within regions where the Colonial influence may be in some respects considered as overlooking its movements and watching for its safety.

Our inquiries lead us to anticipate that the natives of the interior districts adjoining this colony, are generally disposed to welcome the approach of travellers, and to treat them respectfully, lest however the opportunity of easily acquiring by plunder what they exceedingly covet, should prove too tempting for their respect or caution, it is requisite that such an apparent preparation to repel assault should be preserved as may render it obviously perilous to the assailants ; separation of the party must therefore be avoided when holding intercourse with them, and if a division should be unavoidable, the main body must be kept in sufficient strength, and held in readiness to aid the detachments or serve as refuge for them. It will best accord with the object of the expedition, that not only every reasonable probability of avoiding collision should be shunned, but that all scenes and situations offering any likelihood of its occurrence, should be well examined before they are approached.

It will be inconsistent with any beneficial result, that, in its progress outwards, the expedition should force its way through the territory of any tribe disposed to resist it, if no persuasive means be found of avail to overcome their repugnance, the advance in that direction must cease : it is only in case of the party being itself attacked, or being beset by a force showing an obvious disposition to assail it, and a determination to oppose its progress in any direction, or in case of the defiles of a territory being occupied and closed against its

return, that the Committee can reckon it justifiable to exercise upon the lives or persons of the natives those formidable means of warfare with which the expedition has been furnished. It will be proper that each individual attached to the expedition should have a determinate station, in which it is expected that he shall be found in cases of emergency, and it will be well that the measures necessary to be adopted should be fully illustrated and impressed upon all by such previous training as circumstances may admit of.

In regard to the territory the expedition is to visit, there are two methods in which it may arrive at beneficial results: it may either sweep rapidly over a great length of country, with the object of attaining the most distant point which the time allotted to it, or the duration of its resources may enable it to reach; or it may leisurely examine in detail, throughout its length and breadth, the condition, capabilities, and productions of a district of more manageable dimensions. The Committee conceives that the former might be perhaps the more interesting method of proceeding, on account of the greater probability of romantic peril, adventure, or discovery, but that these very circumstances of greater uncertainty and danger, do, in this case, preclude our aiming at the comparatively barren honour of exciting wonder, and of throwing a partial and obscure light on an extended region; the Committee therefore assumes that the last-mentioned of the two courses is, in all respects, more accordant with the views and interests of the Subscribers, as expressed in the Prospectus; the Committee therefore recommends that no endeavour be made to penetrate beyond the parallel of  $20^{\circ}$  south latitude, and that the attempt to reach that parallel be made, only if, in the first place, circumstances favour it greatly, and, secondly, if the intervening districts do not afford objects of sufficient interest and importance to occupy the attention of the expedition. The territory limited by that boundary is about four times the extent of the British Islands. It is in truth to be anticipated that the wide regions between the Cape Territory and the Southern Tropic will have sufficient extent and variety for the time and resources to be employed in our present undertaking. It will, therefore, be advisable that the expedition consider Klaar Water (Griqua Town), or Lattaḡoo, as the starting point or base of their operations, and that its first effort be the examination of the district from which issue the northern branches of the Gariep and the streams which fall down to the Indian Ocean, that then the dividing ridge be traced towards the North, leaving it to the discretion of the Director to determine at what parallel he should change his course, to the north or west. Our present information leads us to esteem it advisable that the eastern side of the slope be examined first, in order that if the great desert of Challahenga should extend far to the eastward, so as to bar the progress of the expedition towards the centre of the Continent, there may remain the unexplored territory along the western slope to occupy its attention in returning. Much of the ultimate importance and interest, as well as the

security of guidance and prospect of safe return of the Expedition, will of course depend on obtaining an exact knowledge and preserving a faithful record of its route, which can only be done by the aid of Astronomical observations made with due regularity and precaution, not only at such stations as form the most interesting features at the moment, in the eyes of those concerned, but at every station where the Expedition may rest long enough to permit observations to be taken deliberately, and with due regard to safety both of the observer and instruments. The track of a caravan on land, as of a ship at sea, is defined as well by the less as the more remarkable points through which it passes, and it may very easily happen that stations of the highest interest in a commercial, political, or physical point of view, may, by reason of that very interest, be inappropriate for selection as principal observing stations, either from the attention of every individual being distracted to duties of immediate necessity or from the risk attending the exhibition of instruments in the unavoidable presence of a rude, curious, and suspicious population. In all such cases it will be proper to connect by observations of a less elaborate nature, those stations with others not far distant, which, although less intrinsically important, may be easier of exact determination. The Committee would therefore recommend, that stations of observation be classed as either *primary* or *secondary*: those to be considered primary stations whenever the circumstances may appear particularly favourable, by reason of leisure from other occupations, expected duration of halt, and freedom from annoyance, to afford a good determination of the longitude and latitude, such as may serve to render them useful for Zero points, to which the secondary stations may be referred, either by dead reckoning of time and distance or by such less elaborate observations as can be obtained at the secondary stations themselves. Of course, however, should circumstances permit, the more important in other respects the point which can be made a primary observing station the better, and the Committee would expressly notice Griqua Town, Lattakoo, Kurrechane, and Meletta, as points of which the Geographical position should be determined with care by observations on the spot, and the observations then made transmitted home along with the latest communications with the Colony. Since, however, the circumstances which may render stations objectionable as primary points are mostly of a moral or political nature, it is expected that no great difficulty will occur in fixing them at positions of especial geographical interest, as at the confluence of rivers, at the extreme borders or on the culminating points of mounting ranges, on remarkable rocks, &c. or at least of determining their bearings and relative situations with respect to such prominent features, with some degree of exactness. A combination of circumstances of this kind of local interest will of course have its due weight in determining (*cæteris paribus*) the halt of the expedition.

At primary stations the Committee recommend the assiduous application of every instrumental means for the determination of the

three elements of latitude, longitude, and elevation above the level of the sea, and especially, at such stations, as many series of lunar distances as possible should be procured in addition to the usual sights for time, (or observations of the altitudes of heavenly bodies near the prime vertical,) which, together with meridian observations for the latitude, they would recommend to be practised daily as a matter of regular duty, at every station, as well primary as secondary. At primary stations also the barometer and thermometer should be observed at regular intervals, and the magnetic variation ascertained *by taking the sun's azimuth immediately before and after the observation for time, (noting the exact moments, and thus obtaining data for interpolating to the time of observation).* At such stations likewise a careful investigation of the Index errors of Sextants should be made, the zero points or index corrections of the Sympiesometer should be determined by leisurely comparison with the mountain barometer (giving time for the instruments to attain the same temperature,) and the difference noted in the observation books. The necessity of frequent comparisons of these instruments, will be apparent if it be considered that in the event of fracture of the barometer tube, no other means will exist by which the zero point of a new one can be determined. Occultations of stars by the moon, and, if possible, eclipses of the satellites of Jupiter should be observed whenever an opportunity may occur. The former especially, affording the best known method of ascertaining the longitude by a single observation should be constantly borne in mind, and the Almanac consulted several days in advance, so that no occultation of a large star certainly identifiable, should be allowed to escape through inadvertence.

The Committee especially recommend that every observation made should be registered in a book devoted to that purpose, and preserved *in the exact terms of the readings off of the instruments and Chronometers*, and kept rigorously separate in its statement from any calculation thereon grounded, and that the observed or presumed index or zero corrections, whether of Chronometer, Sextant, Barometer, or other instrument, should be stated separately in every case, and on no account incorporated with observed quantities, and, moreover, that the observations upon which such index errors have been concluded, should also be preserved. Since however the guidance of the expedition will necessitate the calculation of many observations on the spot, the results of such calculations should be entered (as such) beside the observations from which they have been concluded.

The Committee farther recommend, that the Chronometers with which the expedition has been provided by the liberality of His Majesty's Government should on no account be corrected by moving the hands, however great their errors may become, not even in the extreme case of one or both of them having been allowed to run down. \* In case of such a misfortune (which should be most carefully

guarded against by making it the daily duty of more than one person to remind their bearers to wind them at a stated hour) it will be most convenient in place of setting them, to differ winding them until the hours and minutes come round, at which they may respectively have stopped, as near as may be ascertained from one to the other or from both, to other watches of the party, and such event, should it take place, should be conspicuously noted in the observation book; and, as a further and useful precaution, it is recommended to keep some of the best-going watches belonging to individuals of the expedition, to mean Greenwich time, by frequent comparison with one of the Chronometers. In every case where time is observed express mention should be made of the Chronometer or other watch employed, designating it by the maker's name and number, so that no uncertainty may ever arise as to the proper application of the correction for error and rate.

The rates of the Chronometers should be examined at any station where the expedition may rest two or more consecutive nights, either by equal altitudes of a star or more simply by noticing the disappearance of any large fixed star from the same exact point of view, behind the edge of a board fixed at some considerable distance in the horizon, and having its edge adjusted to a vertical position by a plumb-line; the interval between the two such disappearances being an exact sideral day or 23 h. 56 m. 4 sec. mean time. Under the head of secondary observing stations may be classed those in which no lunar distances can be got, and when the sights for time and meridian altitude can only be superficially and imperfectly taken, or one without the other. With a view to the connection of these with the primary station and to the sketching out a Chart of the Country passed through, at every primary station a series of angles should be taken with the Sextant between remarkable and well-defined points in the horizon, dividing the horizon into convenient portions, and carrying the angles all round the circle back to the point of departure: and in the selection of such points two ends should be kept in view, first, the precise identification of the point of observation, in case of its being desirable to find it again; and, secondly, the determination from it of geographical points. The first of these purposes will require angles to be taken between *near*, the second between *distant* objects. For the latter of course remarkable mountain peaks will, if possible, be chosen. Of such, when once observed, the appearances from the place of observation should be projected by the *Camera Lucida*, and their changes of aspect and form as the expedition advances should be well and carefully noticed, to avoid mistakes. The approximate distance of any remarkable object may be had by pacing or otherwise measuring more exactly, a base line of a few hundred paces, in a direction perpendicular to that in which it appears, erecting a staff at each end, and from each staff measuring the angle between the object and the other staff.

In this manner the neighbourhood of any station may be mapped down so as to be available for many useful purposes. In all such cases the compass bearings of the most important object in the horizon should be taken, and in the absence of the sextant angles, azimuth compass readings of each point may be substituted, though of course with less precision.

Indications of the progress of the expedition should be left at various points in its course by making marks on rocks or stones, &c. and by burying documents in bottles. In regard to the latter it will be necessary to deposit them one foot deep at some known distance, say 15 feet from a conspicuous surface of stone, on which there is painted a circle containing the distance and bearing by compass of the bottle, from its centre, and that the situation of such places of deposit should also be ascertained by exact compass bearings of several remarkable points in the horizon, both near and distant, as well as by angles between them, carefully determined with a sextant, and noted down in the journals of the expedition for their own reference or that of future travellers.

In surveying the basin of a river, or in proceeding along the prevailing slope of a country, it is very desirable to determine as many points as possible on the same level, and form thus as it were a parallel of elevation to the level of the sea. A line of this kind traced at the altitude of, say 1000 feet, would determine in a considerable degree the physical condition of extensive spaces on the map on both sides of it. The stations of most interest will be found at the extremities of transverse arms of the ridge, or in the central and most retiring points of the intervening spaces. Let the general slope of the country on both sides of such stations, be noted as to its rate and direction; and in regard to the vallies which intersect the slope, let their width, direction, and general rate of declivity, and the section and velocity of their streams, be ascertained, and the probable course of the rivers, as far as it can be determined by the appearance of the country, and the reports of the natives; giving them the aboriginal names when they can be discovered. The altitude and acclivity of remarkable peaks or ridges should also be investigated, along with the nature of their climate and of the clouds formed upon them. It will be requisite also to mark with care the nature of the winds and sky as well as the temperature at stations in the neighbourhood, and to note the influence which changes of that description have upon the barometer, and observe also the temperature of deep pools or lakes and copious springs.

The geological structure of the country is especially worthy of minute and extended observation, and will require that notes be kept of all such appearances as indicate or accompany changes of structure in the formation or of components in the soil and surface, especially such fossil remains of plants or animals as may occur, and metallic ores, and that proper specimens accompany these notes, ticketed on the spot with precise localities.

The Botanical researches of the expedition will extend to the preservation of specimens of plants not found in the colony, and especially of transportable roots and the seeds of all such as may be found in a ripened state, noting localities and the varieties of aspect which vegetation puts on in different situations. In regard to other branches of natural history, as it is obvious that after a short experience of research under your direction, almost every one will be able to recognize and preserve what is rare or novel, no further instruction needs to be given, except the general expression of the desire of the Committee that all shall endeavour to secure for the Expedition whatever in any department they esteem valuable, it being expressly understood that every article collected by each individual belongs in property to the Subscribers to the Expedition collectively.

In regard to the inhabitants themselves it is of paramount interest to gain an exact portrait of their life as respects their condition, arts, and policy, their language, their external appearance, population, origin, and relation to other tribes, or in general whatever tends to elucidate their disposition or resources as sharers or agents in commerce, or their preparation to receive Christianity.

It will be proper to ascertain their religious traditions or practices if they have any, distinguishing what is indigenous from the glimmering apprehension of great religious truths which necessarily spreads in advance of the scenes of missionary labour.

Examine also the state of their intellect generally, as exemplified in their social and political arrangements and common traditions, songs, or amusements, and particularly in regard to their knowledge of nature and their notions of its vast and varied proceedings, as thunder, rain, wind, &c.

Enquiries respecting commerce and the prospect of its extension are to be viewed as of no small importance in this undertaking. Every means must be used to ascertain its present nature, channels, and extent, and to determine the existing demand for foreign commodities, and the return which may be expected for them. Proper enquiries may also lead to some satisfactory views of its future condition, as indicated by the wants of the native population, or the objects of most importance to improve their condition, and the corresponding resources for exchange which may arise from a more beneficial employment of their industry.

Lastly, we may notice the propriety of making enquiries or gathering information with respect to similar enterprises, as whether the natives have traditions of movements of their own, or of the arrival of strangers among them. All that can be gathered respecting Dr. Cowan's expedition will be acceptable in the highest degree. The elucidation also of an isolated effort to struggle through the difficulties of African travelling should also be kept in view: it was made by a missionary of the name of Martin, who has not been heard of since he crossed the Colonial boundary in December, 1831. He is

consequently supposed to have perished in the Gariep, or to have been destroyed on its banks, though, as it was his intention to avoid the establishments of Europeans or their lines of communications, there is a lingering possibility of his still surviving.

The articles fitted for carrying on commerce with the natives have three distinct objects :—First, by keeping up a constant appearance of traffic, to present in their eyes an appreciable motive for this visit to their territory. Second, to conciliate favour, or to procure provisions for the purpose of husbanding the resources of the Expedition. And third, for the purpose of procuring any profitable articles to carry on to the other districts for the ends abovementioned, or to sell in the Colony at the termination of the enterprise. In regard to these the Committee has to remark, that attention to the two first-mentioned objects is indispensable, from its necessary connection with the safety and efficiency of the Expedition, and that the third is to be contingent on the acquisitions of the party in regard to its main object of collecting information as to the country, and securing what illustrates its natural history and resources, and on the state of its means of transport. The Committee therefore recommend that this third object be attended to only in case that it be necessary to send waggons back for supplies, or in case that in the homeward progress of the party there be room for such articles without incommoding it in its other operations.

(Signed) THOMAS WADE, CHAIRMAN.  
J. HERSCHELL,  
A. OLIPHANT,  
JAMES ADAMSON, D. D.  
T. M'LEAR,  
A. J. CLOETE,  
C. F. H. von LUDWIG,  
F. S. WATERMEYER,  
JOHN CENTLIVRES CHASE,  
HON. SECRETARY.

*June 23d, 1834.*



We have much pleasure in publishing the following copy of a letter, from the Secretary to the Royal Asiatic Society of Great Britain and Ireland; and in stating that we shall most cordially afford our assistance on the points to which it refers.

All donations of books, or other articles will be received by Mr. J. P. BANTLEMAN, the Librarian of the Society, at the College.—ED.

VII.—*Letter from the Secretary to the Royal Asiatic Society of Great Britain and Ireland.*

THE ROYAL ASIATIC SOCIETY OF GREAT BRITAIN AND IRELAND.

14, Grafton-Street, Bond-Street,  
London, 26th July 1834.

TO JOHN CARNAC MORRIS, ESQ.

*Secretary to the Literary Society and  
Auxiliary Royal Asiatic Society,*  
MADRAS.

SIR,

I have the honor to acquaint you that the Council of the Royal Asiatic Society of Great Britain and Ireland has resolved to request of you to receive all donations to its Library on the part of persons residing within the Presidency of Madras. The Council will also be particularly obliged by your recommending for purchase on account of the Society any work of peculiar interest or value which may not be received for presentation.

If you will have the goodness to make over whatever books or other articles may be sent to you for the Society to Messrs. Binny and Co. they will take care that the same are transmitted to England; and, if it is not giving you too much trouble I shall feel obliged by your favoring me with a letter of advice on all such occasions.

The Council considers it would be advisable that your authority to receive such presentations should be made generally known but the most preferable mode of effecting this object the Council desires to leave with you.

I have the honor to be, &c. &c.

(Signed) H. HARKNESS,  
Secretary.

VIII.—At a General Meeting of the Madras Literary Society and Auxiliary of the Royal Asiatic Society, held at the College on Saturday the 31st January, 1835.

P R E S E N T.

REV. H. HARPER, A. M. *in the Chair.*

R. COLZ, Esq.

J. G. MALCOLMSON, Esq.

T. H. DAVIES, Esq.

REV. F. SPRING, A. M.

and J. C. MORRIS, Esq. *Secretary.*

The meeting having been opened by the Chairman, the Secretary laid before them a statement of the funds of the Society in both its branches.

The following donations having been made to the Society since the last annual general meeting, the thanks of the Society were unanimously voted to the donors.

Asiatic Researches, 17th vol. . . . . Asiatic Society of Bengal.

Prinsep's Memoirs of Ameer Khan . . . J. Prinsep, Esq.

Travels of Macarius, 3d and 4th parts. . . Royal Asiatic Society.

Transactions of the Royal Asiatic Society,

vol. 3, part 2. . . . . Do.

Shea's Translation of Mirkhoud's History

of the early Kings of Persia. . . . . Do.

Tohfut-Ul-Mujahideen, translated into Eng-

lish by Capt. Rowlandson. . . . . Do.

Atkinson's Customs and Manners of the

women of Persia. . . . . Do.

Appendice aux Rudimen's de la Langue

Hindustani, par M. De Taasy. . . . . The Author.

Ancient Canarese Alphabet, 20 copies. . . . Walter Elliot, Esq.

Bytal-Puchise; or the 25 tales of Bytal,

(English translation). . . . . Kalse Krishna Bahadur.

Vidvun-Moda-Taranqulee; or Foun-

tain of pleasure to the learned,

(English translation). . . . . Do.

Owen on Spiritual Gifts. . . . . Rev. W. Taylor.

Beke's Origines Biblicæ. . . . . The Author.

Hikayet Isma Yatim, a Malayan Romance, Lieut. J. Newbold.

A Flying fish and Shark sucker. . . . . J. A. R. Stevenson, Esq.

A set of the Evidence taken by the Com-

mittee of House of Commons. . . . . Do.

The following gentlemen have been elected members since the last general meeting.

Malcolm Lewin, Esq.

T. H. Davidson, Esq.

R. T. Porter, Esq.

W. Douglas, Esq.

J. Thomson, Esq.

A. F. Bruce, Esq.

Major A. Ross,

Lieut. Col. Logan.

Captain Lane,

Captain Pedder,

Dr. Macleod,

Lieut. E. Clutterbuck,

Captain Poole.

Captain Dalrymple,

H. V. Conolly, Esq.

The following vacancies have occurred, by death or retirement since the last general meeting.

|                                       |  |
|---------------------------------------|--|
| <i>Sir Thomas Sevestre</i> ,—Retired. | <i>E. Harding, Esq.</i> —gone to Bengal. |
| <i>Captain C. B. Lindesay</i> , do.   | <i>G. P. Tyler, Esq.</i> —Deceased.      |
| <i>Captain Chase</i> , gone home.     | <i>G. Moore, Esq.</i> do.                |
| <i>Lieut. Col. Napier</i> , do.       | <i>W. Bathie, Esq.</i> do.               |
| <i>Hon. C. Harris, Esq.</i> do.       |  |

Read letter from *Captain T. J. Taylor*, recommending the purchase of certain standard Dictionaries, and books of reference.

With reference to the foregoing letter and to the large surplus in hand in the Asiatic Department, and considering that the subscribers to the Asiatic Department are entitled to the use of the Stock Books of the Society—

Resolved that the sum of Rupees 2,000 be appropriated from the funds of that Department for the purchase of such valuable books in the several branches of literature and science as may be selected by the Committee.

Read letter from the Secretary to the Royal Asiatic Society requesting to receive all donations to its Library on the part of persons residing within the Presidency of Madras, and that the authority to do the same be made generally known in the most preferable mode—

Resolved that a copy of the foregoing letter, be published in the next number of the Madras Journal of Literature and Science; and that it be announced that the Secretary will receive and transmit to England, any books or other articles that may be presented to the Royal Asiatic Society of Great Britain.

Read letter from *M. De Tassy*, presenting the Society with a copy of his edition of the works of the Dukhaneer poet Walli—

Resolved that the thanks of the Society be tendered to *M. De Tassy* for the foregoing work, and that a copy of the 1st vol. of the Madras Journal of Literature and Science, be forwarded for his acceptance.

*Major Keighly, Æ. R. McDonell, Esq. and J. C. Morris, Esq.* who go out by rotation, are re-elected members of the Managing Committee.

*Lt. Col. Napier and Captain Chase*, who have returned to Europe, having been supernumerary members of the Committee, their places are not filled up.

The thanks of the meeting were voted to *Mr. Harper* for his conduct in the chair.

J. C. MORRIS,  
*Secretary M. L. S. &c.*

H. HARPER,  
*Chairman.*



## IX.—METEOROLOGICAL REGISTER KEPT AT THE MADRAS

|        | Sun Rise. | 10 A. M. | Noon.  | 2 P. M. | Sun Set. | 8 P. M. | 10 P. M. | Sun Rise. | 10 A. M. | Noon. | 2 P. M. | Sun Set. | 8 P. M. | 10 P. M. |
|--------|-----------|----------|--------|---------|----------|---------|----------|-----------|----------|-------|---------|----------|---------|----------|
| Inches |           |          |        |         |          |         |          |           |          |       |         |          |         |          |
| 1      | 30-090    | 30-118   | 30-090 | 30-050  | 30-050   | 30-080  | 30-098   | 76-5      | 30-1     | 79-5  | 78-8    | 77-2     | 76-8    | 76-0     |
| 2      | 050       | 094      | 062    | 012     | 046      | 080     | —        | 72-0      | 76-0     | 76-7  | 77-0    | 77-0     | 77-2    | —        |
| 3      | 076       | 142      | 112    | 040     | 072      | 124     | 140      | 72-2      | 79-0     | 80-0  | 80-3    | 77-8     | 77-2    | 76-9     |
| 4      | 088       | 138      | 100    | 058     | 064      | 090     | 104      | 72-0      | 76-8     | 78-2  | 79-0    | 76-6     | 75-5    | 72-7     |
| 5      | 060       | 120      | 094    | 034     | 040      | 096     | —        | 69-6      | 75-9     | 77-0  | 80-0    | 77-7     | 76-2    | —        |
| 6      | 040       | 096      | 056    | 30-015  | 026      | 100     | —        | 74-7      | 77-2     | 77-7  | 78-3    | 76-0     | 75-0    | —        |
| 7      | 060       | 102      | 050    | 29-998  | 014      | 050     | 056      | 75-8      | 77-8     | 79-0  | 80-0    | 79-5     | 77-8    | 76-8     |
| 8      | 068       | 126      | 080    | 30-028  | 060      | 116     | 116      | 75-2      | 77-9     | 78-9  | 80-4    | 80-0     | 79-0    | 78-6     |
| 9      | 112       | 160      | 127    | 058     | 076      | 132     | 142      | 76-7      | 79-5     | 81-0  | 81-4    | 78-8     | 78-6    | 77-6     |
| 10     | 142       | 212      | 182    | 102     | 128      | 178     | 192      | 75-0      | 78-7     | 79-5  | 80-4    | 78-6     | 78-4    | 78-8     |
| 11     | 152       | 232      | 192    | 100     | 120      | 148     | 152      | 74-3      | 79-0     | 79-8  | 80-3    | 79-0     | 77-3    | 75-5     |
| 12     | 134       | 200      | 180    | 082     | 100      | 140     | 156      | 75-3      | 77-4     | 79-4  | 80-0    | 78-8     | 77-5    | 77-0     |
| 13     | 134       | 220      | 196    | 166     | 162      | 196     | 196      | 76-0      | 78-2     | 79-0  | 80-2    | 79-0     | 78-3    | 76-4     |
| 14     | 186       | 220      | 190    | 124     | 134      | 188     | 188      | 76-1      | 79-4     | 79-5  | 79-8    | 78-4     | 78-2    | 77-4     |
| 15     | 144       | 210      | 182    | 100     | 116      | 152     | 160      | 76-2      | 80-0     | 80-0  | 80-2    | 77-3     | 77-5    | 76-4     |
| 16     | 130       | 214      | 186    | 098     | 112      | 154     | —        | 73-5      | 79-7     | 80-2  | 80-2    | 77-7     | 77-8    | —        |
| 17     | 114       | 201      | 172    | 110     | 122      | 172     | 182      | 73-7      | 79-5     | 80-8  | 80-5    | 78-0     | 77-5    | 77-3     |
| 18     | 126       | 218      | 184    | 106     | 108      | 144     | 150      | 70-2      | 79-7     | 79-8  | 79-8    | 77-0     | 76-9    | 77-0     |
| 19     | 114       | 160      | 104    | 034     | 056      | 089     | 104      | 71-4      | 78-8     | 78-9  | 80-4    | 76-5     | 77-6    | 72-0     |
| 20     | 100       | 174      | 130    | 074     | 094      | 134     | 152      | 69-0      | 77-0     | 78-3  | 79-7    | 79-0     | 77-1    | 76-4     |
| 21     | 142       | 212      | 192    | 137     | 160      | 186     | 202      | 72-4      | 78-3     | 78-8  | 79-8    | 79-0     | 77-1    | 75-4     |
| 22     | 180       | 226      | 200    | 154     | 144      | 176     | 180      | 70-8      | 78-9     | 79-6  | 80-0    | 77-9     | 78-0    | 76-4     |
| 23     | 150       | 210      | 184    | 110     | 110      | 142     | 150      | 74-0      | 79-5     | 80-0  | 80-4    | 77-3     | 74-1    | 73-3     |
| 24     | 112       | 186      | 172    | 116     | 108      | 154     | 150      | 72-0      | 79-3     | 80-0  | 80-3    | 78-3     | 77-1    | 77-0     |
| 25     | 099       | 156      | 116    | 074     | 072      | 112     | 120      | 76-4      | 78-7     | 80-3  | 80-3    | 78-3     | 78-0    | 77-0     |
| 26     | 094       | 162      | 130    | 066     | 076      | 116     | 136      | 77-0      | 80-0     | 80-6  | 81-0    | 78-8     | 78-5    | 77-0     |
| 27     | 094       | 180      | 140    | —       | 072      | 114     | —        | 73-3      | 78-5     | 80-4  | —       | 78-0     | 77-4    | —        |
| 28     | 116       | 184      | 154    | 076     | 076      | 134     | 146      | 71-5      | 77-9     | 80-2  | 80-1    | 78-0     | 77-2    | 76-0     |
| 29     | 090       | 158      | 108    | 050     | 058      | 104     | 114      | 73-2      | 77-6     | 79-3  | 79-7    | 77-0     | 76-0    | 76-0     |
| 30     | 090       | 166      | 116    | 078     | 084      | 124     | 132      | 71-0      | 78-5     | 79-4  | 79-8    | 76-7     | 75-5    | 75-0     |
| 31     | 099       | 188      | 146    | 094     | 082      | 120     | 102      | 71-0      | 78-7     | 80-0  | 79-9    | 78-1     | 74-0    | 72-0     |
| Mean   | 30-109    | 30-174   | 30-140 | 30-078  | 30-088   | 30-130  | 30-143   | 73-5      | 78-5     | 79-4  | 79-9    | 78-0     | 77-1    | 76-0     |

## SERVATORY; FOR THE MONTH OF DECEMBER, 1834.

|     | Sun rise. | 10 A. M. | Noon. | 2 P. M. | Sun set. | 8 P. M. | 10 P. M. | RAIN.     |          | Evaporation. | WIND.   |  |
|-----|-----------|----------|-------|---------|----------|---------|----------|-----------|----------|--------------|---------|--|
|     |           |          |       |         |          |         |          | Sun Rise. | Sun Set. |              |         |  |
|     | 0         |          |       |         |          |         |          |           |          |              |         |  |
| 1   | 2.3       | 4.1      | 4.7   | 4.8     | 4.2      | 3.8     | 3.7      | 0.319     | .....    | .....        | N.NE    | Mostly cloudy d<br>& clear night                   |
| 2   | 2.1       | 4.0      | 3.7   | 4.0     | 3.5      | 3.4     | .....    | .....     | .....    | .....        | N.NE.NW |  |
| 3   | 0.7       | 3.8      | 6.0   | 6.3     | 4.1      | 3.4     | 3.9      | .....     | .....    | 2.021        | N.NE    |  |
| 4   | 2.2       | 3.2      | 3.8   | 5.2     | 3.6      | 3.5     | 2.7      | .....     | .....    | .....        | N.NW    |  |
| 5   | 3.4       | 5.1      | 6.5   | 7.0     | 4.7      | 2.7     | .....    | .....     | .....    | .....        | N.NW    |  |
| 6   | 2.2       | 3.4      | 3.7   | 2.5     | 2.0      | 0.8     | .....    | .....     | .....    | .....        | NW.N    | Heavy rain.  |
| 7   | 2.2       | 1.8      | 2.5   | 4.0     | 2.5      | 2.0     | 1.8      | 0.986     | .....    | .....        | N.NE    |  |
| 8   | 1.2       | 1.2      | 1.9   | 2.8     | 3.0      | 2.5     | 2.6      | .....     | .....    | .....        | NE.ESE  |  |
| 9   | 0.7       | 2.2      | 3.0   | 3.7     | 3.3      | 2.7     | 2.8      | .....     | .....    | .....        | N.E     |  |
| 10  | 2.0       | 3.7      | 3.5   | 2.9     | 3.6      | 2.6     | 3.5      | .....     | .....    | 2.188        | NEE     |  |
| 11  | 1.8       | 4.6      | 2.1   | 4.3     | 5.0      | 2.9     | 2.7      | .....     | .....    | .....        | E.NE    | Mostly clear d<br>& night,—De                      |
| 12  | 3.3       | 2.4      | 4.4   | 4.4     | 5.0      | 3.5     | 3.3      | .....     | .....    | .....        | NW.E    |  |
| 13  | 3.0       | 3.6      | 5.0   | 4.7     | 5.0      | 4.0     | 3.9      | .....     | .....    | .....        | NEE     |  |
| 14  | 4.1       | 4.4      | 6.8   | 6.8     | 5.4      | 4.3     | 5.6      | .....     | .....    | .....        | NE.NE   |  |
| 15  | 5.6       | 6.2      | 5.6   | 7.2     | 5.8      | 4.6     | 6.2      | .....     | .....    | .....        | NEE     |  |
| 16  | 5.5       | 8.8      | 10.2  | 7.8     | 7.2      | 7.0     | .....    | .....     | .....    | .....        | NE      | Mostly flying clou<br>[day & nig<br>Flying clouds. |
| 17  | 3.9       | 5.3      | 8.6   | 8.5     | 6.0      | 5.2     | 5.3      | .....     | .....    | 2.278        | NE.N    |  |
| 18  | 2.0       | 5.7      | 5.8   | 6.2     | 4.9      | 3.9     | 4.0      | .....     | .....    | .....        | NE      |  |
| 19  | 1.4       | 5.8      | 4.9   | 6.9     | 4.5      | 5.6     | 1.6      | .....     | .....    | .....        | NE.E.NE |  |
| 20  | 1.0       | 4.0      | 4.3   | 5.0     | 5.0      | 3.1     | 3.9      | .....     | .....    | .....        | NE.ESE  |  |
| 21  | 0.4       | 4.7      | 4.0   | 5.8     | 4.0      | 3.1     | 2.0      | .....     | .....    | .....        | NEE     | Some rain @ nig<br>Mostly clr.—sc<br>[r            |
| 22  | 0.2       | 3.9      | 3.6   | 5.6     | 3.9      | 3.0     | 2.6      | .....     | .....    | .....        | E.NE    |  |
| 23  | 2.0       | 7.6      | 6.0   | 6.4     | 5.5      | 2.0     | 1.8      | .....     | .....    | .....        | NEE     |  |
| 24  | 2.2       | 7.4      | 6.0   | 6.5     | 3.8      | 4.1     | 3.2      | .....     | .....    | 2.187        | N.E.NE  |  |
| 25  | 3.2       | 4.8      | 3.4   | 4.3     | 3.3      | 2.3     | 2.4      | 0.263     | .....    | .....        | NEE     |  |
| 26  | 3.0       | 2.2      | 2.9   | 3.4     | 0.9      | 0.5     | 0.3      | 0.041     | .....    | .....        | E.NE.N  |  |
| 27  | 1.3       | 4.7      | 4.7   | .....   | 4.0      | 3.6     | .....    | .....     | .....    | .....        | E.NE.N  |  |
| 28  | 0.6       | 3.9      | 6.2   | 6.3     | 4.3      | 3.5     | 4.6      | .....     | .....    | .....        | NE.E.N  |  |
| 29  | 2.2       | 3.9      | 6.5   | 7.2     | 4.5      | 4.0     | .....    | .....     | .....    | .....        | NEE     |  |
| 30  | 0.8       | 6.2      | 7.4   | 7.8     | 5.5      | 5.5     | 4.1      | .....     | .....    | .....        | NE.N    |  |
| 31  | 1.0       | 6.5      | 6.3   | 5.1     | 5.6      | 2.2     | 1.0      | .....     | .....    | 2.229        | NEE     |  |
| Jan | 2.2       | 4.6      | 5.0   | 5.4     | 4.3      | 3.4     | 3.2      | .....     | .....    | .....        |         |  |

## METEOROLOGICAL REGISTER KEPT AT THE MADRAS

| Standard Barometer No. 3, by Gilbert. |           |          |        |         |          |         |          | Standard Thermometer by Throughton. |          |       |         |          |         |          |
|---------------------------------------|-----------|----------|--------|---------|----------|---------|----------|-------------------------------------|----------|-------|---------|----------|---------|----------|
|                                       | Sun rise. | 10 A. M. | Noon.  | 2 P. M. | Sun set. | 8 P. M. | 10 P. M. | Sun rise.                           | 10 A. M. | Noon. | 2 P. M. | Sun set. | 8 P. M. | 10 P. M. |
| 635                                   | Inches    |          |        |         |          | .       |          | o                                   |          |       | .       |          |         |          |
| an.                                   |           |          |        |         |          |         |          |                                     |          |       |         |          |         |          |
| 1                                     | 30-052    |          |        |         |          |         |          | 71-0                                |          |       |         |          |         |          |
| 2                                     | 008       | 30-064   | 29-968 |         | 29-974   | 30-010  | 30-012   | 71-3                                | 76-0     | 77-6  |         | 75-0     | 71-8    | 72-8     |
| 3                                     | 018       | 086      | 30-046 | 30-004  | 30-034   | 070     | 064      | 69-8                                | 75-7     | 78-0  | 77-6    | 75-3     | 72-0    | 69-0     |
| 4                                     | 30-028    | 100      | 042    | 30-008  | 30-020   | 046     | 052      | 69-0                                | 73-0     | 75-2  | 76-0    | 76-2     | 71-0    | 68-0     |
| 5                                     | 29-998    | 058      | 010    | 29-982  | 29-988   | 001     | 026      | 68-9                                | 74-3     | 76-0  | 76-4    | 75-5     | 72-5    | 74-2     |
| 6                                     | 30-048    | 126      | 100    | 30-044  | 30-046   | 087     | 094      | 69-0                                | 75-9     | 77-8  | 78-0    | 75-8     | 73-8    | 72-0     |
| 7                                     | 088       | 158      | 108    | 066     | 072      | 126     | 138      | 70-0                                | 77-0     | 78-0  | 79-7    | 77-0     | 76-5    | 75-7     |
| 8                                     | 100       | 180      | 128    | 082     | 084      | 140     | 156      | 68-4                                | 78-4     | 78-3  | 78-9    | 75-5     | 75-3    | 74-5     |
| 9                                     | 112       | 196      | 150    | 090     | 086      | 132     | 140      | 68-7                                | 77-5     | 78-2  | 78-2    | 74-5     | 72-0    | 70-9     |
| 10                                    | 122       | 200      | 160    | 096     | 108      | 156     | 160      | 67-7                                | 75-2     | 77-4  | 76-5    | 75-0     | 74-0    | 72-0     |
| 11                                    | 118       | 170      | 130    | 074     | 070      | 120     | 126      | 68-9                                | 73-9     | 76-8  | 77-2    | 74-3     | 71-0    | 69-5     |
| 12                                    |           |          |        |         | 830      | 070     | 070      |                                     |          |       |         | 74-5     | 71-2    | 69-0     |
| 13                                    |           |          |        |         | 038      | 068     | 052      |                                     |          |       |         | 75-5     | 71-8    | 71-0     |
| 14                                    | 040       | 142      | 103    | 036     | 030      | 065     | 062      | 67-2                                | 75-0     | 76-0  | 77-8    | 76-0     | 73-5    | 69-0     |
| 15                                    | 048       | 180      | 065    | 010     | 0-22     | 077     | 072      | 70-7                                | 74-7     | 77-0  | 77-5    | 75-8     | 73-7    | 70-5     |
| 16                                    | 070       | 136      | 086    | 024     | 042      | 074     | 076      | 71-0                                | 76-3     | 78-4  | 78-0    | 76-5     | 75-9    | 72-3     |
| 17                                    | 040       | 122      | 090    | 032     | 014      | 048     | 066      | 70-1                                | 77-2     | 78-3  | 78-6    | 76-7     | 75-4    | 75-0     |
| 18                                    | 052       | 138      | 102    |         | 070      | 090     | 099      | 67-8                                | 75-7     | 78-0  |         | 76-3     | 73-6    | 69-0     |
| 19                                    | 088       | 136      | 100    | 048     | 052      | 086     | 100      | 69-8                                | 73-9     | 77-5  | 77-5    | 76-1     | 71-8    | 70-1     |
| 20                                    | 080       | 148      | 102    |         | 038      | 078     | 086      | 68-4                                | 75-8     | 77-8  |         | 76-0     | 74-2    | 71-0     |
| 21                                    | 034       | 102      | 064    | 000     | 024      | 078     | 082      | 68-8                                | 76-9     | 78-2  | 78-4    | 76-8     | 76-2    | 75-3     |
| 22                                    | 050       | 146      | 105    | 054     | 078      | 110     | 130      | 69-0                                | 77-1     | 79-0  | 78-5    | 76-3     | 75-1    | 74-9     |
| 23                                    | 092       | 170      | 132    | 070     | 098      | 136     |          | 69-4                                | 77-3     | 78-5  | 78-3    | 77-0     | 76-5    |          |
| 24                                    | 108       | 190      | 150    | 090     | 100      | 134     | 150      | 76-0                                | 80-7     | 80-7  | 80-8    | 78-3     | 78-3    | 77-0     |
| 25                                    | 088       | 168      | 148    | 096     | 104      | 150     | 176      | 77-3                                | 78-3     | 77-8  | 79-3    | 77-0     | 76-4    | 77-0     |
| 26                                    | 128       | 232      | 214    | 184     | 144      | 188     | 210      | 75-3                                | 77-3     | 79-5  | 79-5    | 76-9     | 77-0    | 76-3     |
| 27                                    | 178       | 234      | 200    | 158     | 118      | 156     | 168      | 75-8                                | 78-1     | 79-7  | 79-2    | 77-8     | 77-5    | 77-8     |
| 28                                    | 134       | 202      | 188    | 164     | 136      | 154     | 160      | 76-8                                | 79-7     | 80-6  | 80-5    | 78-0     | 77-8    | 78-0     |
| 29                                    | 152       | 228      | 202    | 154     | 112      | 152     | 158      | 76-7                                | 79-5     | 80-3  | 80-4    | 76-7     | 76-9    | 76-2     |
| 30                                    | 142       | 218      | 196    | 164     | 150      | 166     | 170      | 73-3                                | 78-8     | 80-0  | 80-4    | 77-5     | 76-3    | 76-0     |
| 31                                    | 154       | 234      | 208    | 172     | 166      | 186     | 196      | 69-7                                | 78-5     | 79-6  | 80-0    | 77-7     | 77-3    | 76-5     |
| Jan                                   | 30-082    | 30-159   | 30-118 | 30-076  | 30-069   | 30-105  | 30-112   | 70-9                                | 76-7     | 78-2  | 78-5    | 76-2     | 74-5    | 73-1     |

## OBSERVATORY; FOR THE MONTH OF JANUARY 1835.

|    | Dep. of wet bulb Thermometer. |          |       |         |          |         | Rain.    |           | Evaporation. | Wind.           | Remarks.                |
|----|-------------------------------|----------|-------|---------|----------|---------|----------|-----------|--------------|-----------------|-------------------------|
|    | Sun rise.                     | 10 A. M. | Noon. | 2 P. M. | Sun set. | 8 P. M. | 10 P. M. | Sun rise. | Sun set.     |                 |                         |
|    | 0                             |          |       |         |          |         |          |           |              |                 |                         |
| 1  | 0.5                           |          |       |         |          |         |          |           |              | N.NE            |                         |
| 2  | 2.4                           | 5.4      | 5.3   |         | 4.1      | 2.1     | 2.8      |           |              | NW.NNE          |                         |
| 3  | 1.8                           | 5.7      | 7.7   | 5.1     | 3.8      | 2.1     | 0.5      |           |              | N.NE.E          |                         |
| 4  | 2.6                           | 2.1      | 3.4   | 4.4     | 4.2      | 1.5     | 2.0      |           |              | E.SE.           | Foggy.                  |
| 5  | 2.7                           | 3.6      | 5.5   | 5.6     | 2.7      | 2.5     | 3.6      |           |              | E.SE            | Mostly clear.           |
| 6  | 2.2                           | 3.9      | 5.8   | 5.0     | 3.7      | 1.8     | 1.0      |           |              | N.EE            | day & night             |
| 7  | 0.8                           | 5.3      | 5.8   | 7.7     | 5.0      | 4.5     | 5.4      |           |              | 1,944 N.E.E.S.E | dew                     |
| 8  | 2.4                           | 7.8      | 7.9   | 9.4     | 5.5      | 3.5     | 6.5      |           |              | N.E.E.S.E       |                         |
| 9  | 2.7                           | 9.5      | 8.5   | 8.4     | 7.5      | 2.7     | 1.9      |           |              | N.EE            | Mostly cloudy.          |
| 10 | 1.7                           | 7.0      | 9.4   | 7.5     | 7.5      | 5.8     | 4.0      |           |              | N.E.N.E         | Mostly cloudy.          |
| 11 | 3.9                           | 5.9      | 7.3   | 5.4     | 6.3      | 3.1     | 2.5      |           |              | NW.NE           |                         |
| 12 |                               |          |       |         | 4.7      | 2.0     | 1.5      |           |              | N.EE            |                         |
| 13 |                               |          |       |         | 3.5      | 1.8     | 5.0      |           |              | N.EE            | } Mostly clear and dew. |
| 14 | 2.2                           | 2.8      | 2.3   | 3.8     | 3.0      | 1.2     | 1.1      |           |              | 2,326 N.EE      |                         |
| 15 | 1.5                           | 2.3      |       | 2.5     | 1.3      | 0.0     | 0.5      |           |              | SW.E            |                         |
| 16 | 1.1                           | 3.3      | 5.2   | 4.0     | 3.6      | 3.4     | 0.3      |           |              | N.EE            | Mostly clear.           |
| 17 | 2.1                           | 6.2      | 6.3   | 6.1     | 4.7      | 2.7     | 3.0      |           |              | E.NE            | Mostly cloudy.          |
| 18 | 1.8                           | 4.5      | 6.0   |         | 4.8      | 4.0     | 3.0      |           |              | N.E.E.S.E       |                         |
| 19 | 2.8                           | 2.9      | 5.5   | 5.0     | 4.1      | 1.8     | 2.1      |           |              | W.E.S.E         |                         |
| 20 | 1.4                           | 4.8      | 5.8   |         | 4.3      | 3.2     | 2.0      |           |              | N.E.S.E         | } Mostly clear and dew. |
| 21 | 1.6                           | 4.9      | 5.2   | 4.4     | 4.0      | 3.4     | 3.3      |           |              | 1,840 N.E.S.E   |                         |
| 22 | 1.0                           | 5.3      | 7.0   | 5.0     | 4.3      | 3.1     | 2.9      |           |              | N.E.E.S.E       |                         |
| 23 | 0.4                           | 5.1      | 4.5   | 4.3     | 3.8      | 2.5     |          |           |              | N.NE            |                         |
| 24 | 3.0                           | 5.7      | 4.7   | 5.3     | 5.4      | 5.2     | 4.0      |           |              | N.E.N           | } Mostly cloudy         |
| 25 | 3.8                           | 3.3      | 2.0   | 4.3     | 3.5      | 3.9     | 3.5      |           |              | N.E.N           |                         |
| 26 | 3.3                           | 5.3      | 7.3   | 7.5     | 5.0      | 5.0     | 3.3      |           |              | E.NE            |                         |
| 27 | 3.3                           | 6.1      | 3.7   | 4.2     | 5.3      | 3.7     | 3.8      |           |              | N.E.N           | Cloudy day.             |
| 28 | 2.7                           | 3.7      | 4.6   | 6.4     | 4.0      | 5.4     | 5.3      | 0.056     |              | 2,285 E.NE      | Cloudy day.             |
| 29 | 2.7                           | 5.1      | 4.1   | 5.5     | 4.7      | 5.1     | 4.0      |           |              | E.NE            | Mo. cl. day &           |
| 30 | 2.3                           | 5.8      | 5.2   | 5.4     | 5.5      | 4.4     | 4.0      |           |              | N.EE            | clear night             |
| 31 | 0.2                           | 5.5      | 6.6   | 6.3     | 3.7      | 4.2     | 4.0      |           |              | N.EE            | } Most'y clear.         |
|    | 2.1                           | 5.0      | 5.7   | 5.5     | 4.4      | 3.2     | 3.0      |           |              |                 |                         |



## METEOROLOGICAL REGISTER KEPT AT THE MADRAS

|            | Sun rise. | 10 A. M. | Noon.  | 2 P. M. | Sun set. | 8 P. M. | 10 P. M. | Sun rise. | 10 A. M. | Noon. | 2 P. M. | Sun set. | 8 P. M. | 10 P. M. |
|------------|-----------|----------|--------|---------|----------|---------|----------|-----------|----------|-------|---------|----------|---------|----------|
| 335<br>eb. | Inches    |          |        |         |          |         |          | o         |          |       |         |          |         |          |
| 1          | 30.184    | 30.252   | 30.200 | 30.174  | 30.168   | 30.180  | 30.194   | 75.0      | 79.0     | 80.0  | 80.5    | 77.3     | 76.0    | 71.8     |
| 2          | 190       |          | 188    | 156     | 146      | 168     | 178      | 71.6      |          | 79.5  | 79.9    | 76.9     | 74.9    | 72.8     |
| 3          | 152       | 190      | 160    | 102     | 103      | 135     | 143      | 67.2      | 75.8     | 78.5  | 78.7    | 78.0     | 75.1    | 70.8     |
| 4          | 110       | 192      | 164    | 112     | 104      | 126     | 144      | 64.8      | 76.9     | 78.9  | 78.9    | 77.0     | 73.6    | 71.7     |
| 5          | 122       | 194      | 144    | 100     | 116      | 150     | 156      | 67.1      | 76.9     | 78.8  | 79.3    | 77.3     | 76.0    | 76.0     |
| 6          | 116       | 182      | 140    | 094     | 090      | 133     | 152      | 70.0      | 77.8     | 80.0  | 80.4    | 77.9     | 77.6    | 77.0     |
| 7          | 116       | 190      | 138    | 104     | 110      | 152     | 176      | 72.0      | 79.7     | 81.0  | 81.5    | 78.0     | 77.9    | 77.6     |
| 8          | 118       |          | 156    | 104     | 110      | 150     | 172      | 73.0      |          | 80.1  | 80.9    | 78.1     | 77.8    | 76.9     |
| 9          | 116       | 202      | 162    | 096     | 108      | 134     | 152      | 73.0      | 79.3     | 80.3  | 80.7    | 78.2     | 76.7    | 74.0     |
| 10         | 122       | 200      | 168    | 118     | 104      | 154     | 174      | 68.8      | 77.9     | 79.0  | 80.0    | 78.9     | 77.9    | 77.6     |
| 11         | 106       | 184      | 150    | 100     | 100      | 136     | 150      | 70.0      | 78.7     | 79.7  | 80.2    | 77.9     | 76.9    | 76.2     |
| 12         | 106       | 166      | 108    | 075     | 078      | 110     | 122      | 68.3      | 77.1     | 78.4  | 80.3    | 77.2     | 75.9    | 75.3     |
| 13         | 064       | 144      | 100    | 062     | 070      | 096     | 112      | 67.9      | 77.8     | 78.5  | 79.0    | 77.5     | 77.9    | 77.3     |
| 14         | 060       | 146      | 106    | 056     | 068      | 087     | 109      | 69.8      | 78.8     | 80.0  | 80.6    | 78.0     | 77.3    | 77.0     |
| 15         | 106       |          | 108    | 077     | 052      | 072     | 086      | 76.4      |          | 80.3  | 80.7    | 79.2     | 77.2    | 76.4     |
| 16         | 046       | 106      | 060    | 022     | 018      | 050     | 064      | 71.0      | 77.0     | 79.5  | 80.4    | 77.5     | 77.0    | 77.0     |
| 17         | 000       | 084      | 038    | 006     | 032      | 064     | 084      | 65.3      | 76.1     | 79.0  | 78.0    | 76.0     | 76.1    | 74.5     |
| 18         | 050       | 122      | 078    | 025     | 040      | 098     | 102      | 68.0      | 77.3     | 79.3  | 80.5    | 77.9     | 78.0    | 77.3     |
| 19         | 066       | 160      | 108    | 074     | 088      | 108     | 138      | 69.8      | 79.8     | 81.1  | 81.0    | 78.3     | 78.3    | 77.9     |
| 20         | 088       | 198      | 138    | 100     | 100      | 136     | 156      | 68.8      | 79.0     | 80.8  | 81.4    | 78.8     | 78.0    | 77.8     |
| 21         | 096       | 172      | 124    | 090     | 070      | 092     | 094      | 69.0      | 79.0     | 80.6  | 81.0    | 78.2     | 77.9    | 74.0     |
| 22         | 080       |          | 098    | 058     | 048      | 084     | 098      | 66.0      |          | 79.0  | 80.6    | 77.9     | 75.9    | 71.6     |
| 23         | 046       | 130      | 090    | 086     | 080      | 068     | 080      | 68.9      | 76.3     | 80.9  | 81.6    | 78.1     | 77.0    | 76.9     |
| 24         | 30.023    | 086      | 30.038 | 30.000  | 29.986   | 30.010  | 30.008   | 69.3      | 78.9     | 82.4  | 83.0    | 80.7     | 80.0    | 78.8     |
| 25         | 29.968    | 042      | 29.988 | 29.962  | 29.964   | 29.980  | 29.978   | 73.0      | 80.2     | 83.0  | 85.0    | 80.2     | 79.3    | 78.8     |
| 26         | 29.960    | 026      | 29.980 | 29.950  | 29.952   | 29.973  | 29.978   | 73.1      | 80.8     | 82.5  | 83.2    | 80.7     | 80.3    | 78.0     |
| 27         | 29.982    | 30.067   | 30.020 | 29.986  | 29.998   | 30.050  | 30.050   | 73.3      | 79.3     | 81.9  | 82.6    | 80.8     | 79.5    | 77.0     |
| 28         | 30.006    | 29.996   | 050    | 30.012  | 29.992   | 30.016  | 30.022   | 69.0      | 79.3     | 81.0  | 82.2    | 80.2     | 78.6    | 76.2     |
| 29         | 30.079    | 30.143   | 30.107 | 30.068  | 30.067   | 30.097  | 30.110   | 70.0      | 78.3     | 80.1  | 80.8    | 78.3     | 77.3    | 75.9     |

## OBSERVATORY, FOR THE MONTH OF FEBRUARY 1835.

|    | Sun rise. | 10 A. M. | Noon. | 2 P. M. | Sun set. | 8 P. M. | 10 P. M. | Rain.     |          | Evaporation. | Wind.      |  |
|----|-----------|----------|-------|---------|----------|---------|----------|-----------|----------|--------------|------------|--|
|    | o         |          |       |         |          |         |          | Sun rise. | Sun set. |              |            |  |
| 1  | 2.8       | 6.6      | 7.8   | 6.5     | 5.3      | 4.0     | 1.8      | .....     | .....    | 2.049        | N.E.       | Mostly clear.  |
| 2  | 2.4       | 6.0      | 6.7   | 4.6     | 2.9      | 2.5     | .....    | .....     | .....    |              | E. N.E.    |  |
| 3  | 2.0       | 3.7      | 6.0   | 4.7     | 4.1      | 3.0     | 0.8      | .....     | .....    |              | N.W.E.S.E. |  |
| 4  | 1.0       | 6.6      | 7.4   | 6.9     | 5.2      | 3.6     | 1.7      | .....     | .....    |              | E.S.E.N.E. |  |
| 5  | 3.1       | 5.2      | 5.8   | 5.6     | 5.0      | 4.0     | 3.2      | .....     | .....    |              | N.E.E.     |  |
| 6  | 1.2       | 3.9      | 5.0   | 4.7     | 3.4      | 2.6     | 2.0      | .....     | .....    | 1.875        | N.E.       | Mostly hazy day<br>& clear night.  |
| 7  | 0.2       | 3.9      | 5.0   | 5.1     | 4.7      | 2.9     | 2.8      | .....     | .....    |              | N.E.E.     |  |
| 8  | 1.0       | 4.2      | 5.4   | 3.8     | 3.8      | 2.9     | .....    | .....     | .....    |              | E.N.E.     |  |
| 9  | 0.5       | 5.4      | 6.3   | 5.7     | 3.2      | 3.2     | 4.0      | .....     | .....    |              | "          |  |
| 10 | 0.8       | 4.1      | 4.1   | 5.4     | 4.6      | 4.3     | 4.6      | .....     | .....    |              | E.S.E.N.E. |  |
| 11 | 1.1       | 5.3      | 5.5   | 6.2     | 5.4      | 4.4     | 4.2      | .....     | .....    | 2.187        | N.E.E.S.E. | Mly. flying clouds.  |
| 12 | 0.3       | 5.2      | 4.4   | 7.5     | 5.1      | 3.9     | 3.3      | .....     | .....    |              | N.E.E.     |  |
| 13 | 0.9       | 4.9      | 4.9   | 5.0     | 4.5      | 4.8     | 4.8      | .....     | .....    |              | N.E.E.S.E. |  |
| 14 | 1.8       | 6.5      | 6.3   | 6.6     | 6.2      | 5.8     | 5.7      | .....     | .....    |              | E.N.E.S.E. |  |
| 15 | 3.6       | 9.0      | 8.7   | 6.2     | 5.5      | 6.4     | .....    | .....     | .....    |              | N.E.E.S.E. |  |
| 16 | 3.0       | 5.0      | 7.0   | 8.4     | 5.5      | 5.1     | 5.0      | .....     | .....    | 2.083        | S.E.E.     | Mly. hy. day & Cr. Nt.<br>Mly. cy. day & Cr. Nt.<br>Mostly clear.<br>Mostly flying clouds.<br>Mostly hazy. |
| 17 | 0.8       | 4.2      | 7.0   | 6.0     | 4.0      | 4.6     | 4.5      | .....     | .....    |              | "          |  |
| 18 | 2.0       | 5.0      | 5.1   | 5.3     | 5.4      | 4.0     | 3.3      | .....     | .....    |              | N.E.S.E.   |  |
| 19 | 0.5       | 4.1      | 6.1   | 4.7     | 3.3      | 3.3     | 2.9      | .....     | .....    |              | E.S.E.     |  |
| 20 | 1.8       | 4.9      | 6.8   | 5.4     | 1.8      | 3.2     | 2.8      | .....     | .....    |              | N.E.E.S.E. |  |
| 21 | 4.0       | 6.0      | 4.6   | 5.2     | 3.0      | 3.9     | 3.0      | .....     | .....    | 2.083        | "          | Clear.   |
| 22 | 0.3       | 4.7      | 5.4   | 3.9     | 2.9      | 1.4     | .....    | .....     | .....    |              | "          |  |
| 23 | 2.9       | 4.1      | 7.3   | 8.0     | 4.1      | 3.0     | 2.9      | .....     | .....    |              | N.N.E.S.E. |  |
| 24 | 1.2       | 2.3      | 4.8   | 7.5     | 2.2      | 2.2     | 1.8      | .....     | .....    |              | S.E.S.E.   |  |
| 25 | 0.5       | 2.9      | 4.5   | 8.5     | 1.6      | 1.8     | .....    | .....     | .....    |              | S.S.E.     |  |
| 26 | 1.1       | 3.8      | 5.5   | 7.7     | 1.9      | 3.9     | 2.0      | .....     | .....    |              | S.W.S.E.S. |  |
| 27 | 1.3       | 3.7      | 7.9   | 7.9     | 1.6      | 3.7     | 4.0      | .....     | .....    |              | E.S.E.S.   |  |
| 28 | 1.2       | 3.6      | 6.0   | 5.2     | 4.2      | 3.4     | 2.2      | .....     | .....    |              | S.E.E.     |  |
| 29 | 1.5       | 4.6      | 5.9   | 6.3     | 4.2      | 3.7     | 3.2      | .....     | .....    |              | .....      |  |

The instruments with which the foregoing observations have been made, are placed upon a table about 4 feet above the ground in the western verandah of the Honorable Company's Observatory ; which is situated in longitude  $5^h. 21^m. 9^s.$  E. latitude  $13^d. 4^m. 3^s.$  N. ; at about two miles from the sea and about 27 feet above the low water mark.

T. G. TAYLOR,  
*H. C. Astronomer.*



## X.—METEOROLOGICAL REGISTER KEPT AT VIZIANAGRAM;

|      | MOISTURE.                       |   |                     |          |            |                                   |             |                     |          |            |                     |          |            |  |
|------|---------------------------------|---|---------------------|----------|------------|-----------------------------------|-------------|---------------------|----------|------------|---------------------|----------|------------|--|
|      | 10 A. M.                        |   |                     |          |            |                                   |             | 10 P. M.            |          |            |                     |          |            |  |
| Day. | Centigrade, wet<br>Thermometer. | Difference between<br>wet & dry Ther-<br>mometer. | Quantity of vapour. | Dryness. | Dew point. | Wet<br>Thermometer<br>Centigrade. | Difference. | Quantity of vapour. | Dryness. | Dew point. | Quantity of vapour. | Dryness. | Dew point. |  |
| 1    | 13,6                            | 9,1   | 96,5                | 159,1    | 0,8        | 15,5                              | 8,9         | 115,7               | 193,1    | 3,1        | 106,1               | 193,1    | 3,1        |  |
| 2    | 14,3                            | 6,2   | 131,7               | 126,2    | 5,9        | 15,5                              | 5,5         | 145,3               | 114,3    | 8,1        | 148,3               | 114,3    | 6,1        |  |
| 3    | 15,3                            | 6,6   | 134,4               | 137,4    | 6,3        | 17,2                              | 3,9         | 182,4               | 82,7     | 13,4       | 158,2               | 82,7     | 13,4       |  |
| 4    | 16,6                            | 5,6   | 159,4               | 119,6    | 10,1       | 18,3                              | 4,7         | 185,9               | 108,6    | 13,4       | 167,6               | 108,6    | 13,4       |  |
| 5    | 16,4                            | 8,3   | 133,5               | 175,3    | 6,4        | 16,3                              | 4,4         | 165,9               | 96,7     | 13,7       | 161,2               | 96,7     | 13,7       |  |
| 6    | 15,3                            | 9,7   | 103,3               | 210,3    | 0,7        | 14,4                              | 6,1         | 133,6               | 124,3    | 6,3        | 118,3               | 124,3    | 6,3        |  |
| 7    | 13,8                            | 7,8   | 111,3               | 160,1    | 2,3        | 13,3                              | 6,7         | 117,9               | 134,1    | 3,5        | 114,6               | 134,1    | 3,5        |  |
| 8    | 11,1                            | 10,8  | 59,3                | 216,1    | 11,4       | 12,7                              | 5,6         | 113,8               | 119,1    | 2,8        | 86,4                | 119,1    | 2,8        |  |
| 9    | 11,1                            | 10,5  | 62,3                | 209,4    | 10,3       | 12,2                              | 6,4         | 111,6               | 114,6    | 2,4        | 86,8                | 114,6    | 2,4        |  |
| 10   | 10,5                            | 11,7  | 45,4                | 233,6    | 14,8       | 12,7                              | 6,7         | 112,8               | 132,3    | 2,8        | 78,9                | 132,3    | 2,8        |  |
| 11   | 13,2                            | 10,4  | 80,3                | 217,6    | 4,6        | 13,8                              | 7,1         | 119,3               | 142,2    | 3,8        | 99,6                | 142,2    | 3,8        |  |
| 12   | 15,5                            | 6,4   | 140,7               | 134,4    | 7,4        | 17,2                              | 3,9         | 182,4               | 82,7     | 13,3       | 161,5               | 82,7     | 13,3       |  |
| 13   | 16,6                            | 6,7   | 148,4               | 145,1    | 8,6        | 16,6                              | 5,9         | 156,4               | 126,5    | 9,7        | 152,4               | 126,5    | 9,7        |  |
| 14   | 16,6                            | 5,9   | 156,4               | 126,5    | 9,7        | 17,7                              | 5,3         | 176,6               | 109,1    | 12,3       | 166,5               | 109,1    | 12,3       |  |
| 15   | 17,2                            | 4,4   | 177,4               | 96,5     | 12,4       | 20,3                              | 3,3         | 222,3               | 67,5     | 17,8       | 199,7               | 67,5     | 17,3       |  |
| 16   | 18,3                            | 6,7   | 152,7               | 160,6    | 9,1        | 17,2                              | 5,3         | 168,4               | 114,5    | 11,3       | 160,5               | 114,5    | 11,3       |  |
| 17   | 18,8                            | 5,3   | 158,4               | 112,3    | 13,7       | 18,3                              | 5,3         | 182,9               | 110,6    | 13,3       | 155,6               | 110,6    | 13,3       |  |
| 18   | 19,4                            | 5,3   | 195,1               | 113,7    | 14,4       | 19,7                              | 4,1         | 207,6               | 92,8     | 15,6       | 201,3               | 92,8     | 15,6       |  |
| 19   | 19,9                            | 4,5   | 205,8               | 103,3    | 15,6       | 20,3                              | 2,2         | 240,3               | 49,1     | 18,3       | 217,9               | 49,1     | 18,3       |  |
| 20   | 19,4                            | 5,6   | 189,1               | 128,4    | 13,8       | 19,7                              | 3,3         | 218,6               | 67,3     | 16,9       | 203,8               | 67,3     | 16,9       |  |
| 21   | 18,3                            | 6,1   | 165,9               | 131,6    | 10,9       | 19,6                              | 3,7         | 210,4               | 83,1     | 16,1       | 193,1               | 83,1     | 16,1       |  |
| 22   | 17,5                            | 6,9   | 155,5               | 153,3    | 9,6        | 17,5                              | 5,5         | 167,5               | 112,3    | 11,2       | 161,3               | 112,3    | 11,2       |  |
| 23   | 18,6                            | 7,3   | 168,4               | 160,6    | 11,3       | 18,8                              | 4,5         | 193,4               | 100,1    | 14,3       | 181,3               | 100,1    | 14,3       |  |
| 24   | 18,2                            | 6,2   | 169,9               | 138,9    | 11,4       | 17,2                              | 5,3         | 168,4               | 114,5    | 11,3       | 169,1               | 114,5    | 11,3       |  |
| 25   | 17,5                            | 6,6   | 158,5               | 144,6    | 10,3       | 14,4                              | 7,3         | 124,6               | 144,5    | 4,8        | 141,5               | 144,5    | 4,8        |  |
| 26   | 13,6                            | 10,5  | 82,5                | 221,6    | 4,1        | 15,7                              | 6,2         | 144,6               | 130,5    | 8,3        | 113,5               | 130,5    | 8,3        |  |
| 27   | 16,6                            | 7,7   | 138,4               | 169,3    | 7,3        | 19,6                              | 3,7         | 210,4               | 83,1     | 16,1       | 181,3               | 83,1     | 16,1       |  |
| 28   | 16,6                            | 7,8   | 147,4               | 161,4    | 8,4        | 18,8                              | 4,2         | 196,4               | 93,1     | 14,6       | 172,3               | 93,1     | 14,6       |  |
| 29   | 18,8                            | 6,5   | 173,4               | 148,6    | 11,9       | 18,6                              | 5,3         | 186,4               | 112,3    | 13,7       | 176,3               | 112,3    | 13,7       |  |
| 30   | 17,9                            | 7,9   | 149,7               | 179,3    | 8,7        | 19,4                              | 5,6         | 189,1               | 128,4    | 13,8       | 169,4               | 128,4    | 13,8       |  |
| 31   | 18,3                            | 7,5   | 157,9               | 171,1    | 9,9        | 17,7                              | 4,5         | 181,6               | 97,4     | 12,9       | 169,7               | 97,4     | 12,9       |  |
| Mean | 16,26                           | 7,35  | 140,3               | 138,6    | 6,3        | 17,01                             | 5,11        | 169,2               | 109,3    | 11,3       | 154,3               | 133,8    | 8,6        |  |

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FOR THE MONTH OF JANUARY, 1835.

| Rain in inches.      |                      |        | Evaporation—Leslie's<br>Atmometer. |                      |        | Temperature—Fahrenheit's<br>Thermometer. |          |       |
|----------------------|----------------------|--------|------------------------------------|----------------------|--------|--|----------|-------|
| 10 P. M. to 10 A. M. | 10 A. M. to 10 P. M. | Total. | 10 P. M. to 10 A. M.               | 10 A. M. to 10 P. M. | Total. | 10 A. M.                                 | 10 P. M. | Mean. |
| —                    | —                    | —      | ,028                               | ,074                 | ,102   | 73                                       | 76       | 74½   |
| —                    | —                    | —      | ,036                               | ,064                 | ,100   | 69                                       | 69       | 69    |
| —                    | —                    | —      | ,038                               | ,058                 | ,096   | 71                                       | 70       | 70½   |
| —                    | —                    | —      | ,037                               | ,052                 | ,089   | 72                                       | 73½      | 72½   |
| —                    | —                    | —      | ,030                               | ,070                 | ,100   | 76                                       | 73       | 74½   |
| —                    | —                    | —      | ,053                               | ,117                 | ,170   | 76½                                      | 69       | 72½   |
| —                    | —                    | —      | ,041                               | ,090                 | ,131   | 71                                       | 68       | 69½   |
| —                    | —                    | —      | ,050                               | ,086                 | ,136   | 71½                                      | 65       | 68½   |
| —                    | —                    | —      | ,056                               | ,084                 | ,140   | 71                                       | 65½      | 68½   |
| —                    | —                    | —      | ,061                               | ,082                 | ,143   | 72                                       | 67       | 69½   |
| —                    | —                    | —      | ,061                               | ,098                 | ,159   | 74½                                      | 69½      | 72    |
| —                    | —                    | —      | ,030                               | ,094                 | ,124   | 71½                                      | 70       | 70½   |
| —                    | —                    | —      | ,032                               | ,077                 | ,103   | 74                                       | 72½      | 73½   |
| —                    | —                    | —      | ,027                               | ,076                 | ,103   | 72½                                      | 73       | 72½   |
| —                    | —                    | —      | ,024                               | ,070                 | ,094   | 71½                                      | 73½      | 72½   |
| —                    | —                    | —      | ,034                               | ,074                 | ,108½  | 76½                                      | 72½      | 74½   |
| —                    | —                    | —      | ,018                               | ,059                 | ,077   | 75                                       | 74       | 74½   |
| —                    | —                    | —      | ,029                               | ,057                 | ,086   | 76                                       | 75       | 75½   |
| —                    | —                    | —      | ,019                               | ,058                 | ,077   | 76                                       | 72       | 74    |
| —                    | —                    | —      | ,025                               | ,062                 | ,087   | 77                                       | 73       | 75    |
| —                    | —                    | —      | ,030                               | ,060                 | ,090   | 77                                       | 74       | 75½   |
| —                    | —                    | —      | ,031                               | ,065                 | ,099   | 76                                       | 73½      | 74½   |
| —                    | —                    | —      | ,036                               | ,068                 | ,104   | 78½                                      | 74       | 76½   |
| —                    | —                    | —      | ,040                               | ,076                 | ,116   | 76                                       | 72½      | 74½   |
| —                    | —                    | —      | ,051                               | ,066                 | ,129   | 75½                                      | 70½      | 73    |
| —                    | —                    | —      | ,030                               | ,065                 | ,095   | 75½                                      | 71½      | 73½   |
| —                    | —                    | —      | ,029                               | ,062                 | ,091   | 75½                                      | 74       | 74½   |
| —                    | —                    | —      | ,030                               | ,062                 | ,092   | 76                                       | 73½      | 74½   |
| —                    | —                    | —      | ,024                               | ,050                 | ,074   | 77½                                      | 75       | 76½   |
| —                    | —                    | —      | ,034                               | ,069                 | ,103   | 78½                                      | 77       | 77½   |
| —                    | —                    | —      | ,030                               | ,066                 | ,096   | 78½                                      | 72       | 75½   |
| None.                |                      |        | 1,107                              | 2,207                | 3,314  | 74½                                      | 72       | 73½   |

## METEOROLOGICAL REGISTER KEPT AT VIZIANAGRAM;

## WINDS—THEIR DIRECTION AND STRENGTH.

| Day.              | 6 to 9 A. M. |             | 9 A. M. to noon. |             | Noon to 3 P. M. |             | 3 P. M. to 6 P. M. |             | 6 to 9 P. M. |          | Night.    |          |
|-------------------|--------------|-------------|------------------|-------------|-----------------|-------------|--------------------|-------------|--------------|----------|-----------|----------|
|                   | Direction    | Strength    | Direction        | Strength    | Direction       | Strength    | Direction          | Strength    | Direction    | Strength | Direction | Strength |
| 1                 | N            | lgt. breeze |                  |             | E               | breeze      | E                  | breeze      | NE           | airs     |           | calm     |
| 2                 | do           | do          | NE               | calm        | NE              | do          | NE                 | airs        | do           | do       |           | do       |
| 3                 |              | calm        |                  | calm        | SW              | do          | do                 | do          |              | calm     |           | do       |
| 4                 |              | do          | SW               | breeze      |                 | calm        | SW                 | airs        |              | do       |           | do       |
| 5                 | N            | airs        |                  | calm        |                 | calm        | NE                 | breeze      |              | do       |           | do       |
| 6                 | do           | do          |                  | do          | NE              | lgt. breeze | do                 | do          |              | do       |           | do       |
| 7                 | do           | do          |                  | do          | do              | do          |                    | calm        |              | do       |           | do       |
| 8                 | do           | do          | NE               | breeze      | do              | do          |                    | do          |              | do       |           | do       |
| 9                 | do           | do          |                  | calm        | do              | do          |                    | do          |              | do       |           | do       |
| 10                | do           | do          |                  | calm        | do              | do          |                    | do          |              | do       |           | do       |
| 11                | NE           | breeze      | NE               | breeze      | do              | do          |                    | do          |              | do       |           | do       |
| 12                |              | calm        |                  | calm        | do              | airs        |                    | do          |              | do       |           | do       |
| 13                | SW           | airs        |                  | do          | SW              | lgt. breeze |                    | do          |              | do       |           | do       |
| 14                |              | calm        |                  | do          | do              | do          |                    | do          |              | do       |           | do       |
| 15                |              | do          | NE               | airs        | do              | do          |                    | do          | E            | airs     |           | do       |
| 16                |              | do          |                  | calm        | E               | do          | E                  | airs        | do           | do       |           | do       |
| 17                |              | do          |                  | do          | SE              | do          |                    | calm        |              | calm     |           | do       |
| 18                |              | do          |                  | do          | do              | do          | SE                 | lgt. breeze |              | do       |           | do       |
| 19                |              | do          |                  | do          | do              | do          | do                 | do          |              | do       |           | do       |
| 20                |              | do          |                  | do          | do              | do          | do                 | do          |              | do       |           | do       |
| 21                |              | do          |                  | do          | do              | do          | do                 | do          |              | do       |           | do       |
| 22                |              | do          |                  | do          | do              | do          | do                 | do          | E            | airs     |           | do       |
| 23                | NE           | airs        | NE               | lgt. breeze | E               | high wind   | E                  | wind        | do           | do       | E         | airs     |
| 24                | do           | do          | do               | do          | do              | wind        | do                 | do          | do           | do       | do        | do       |
| 25                | NE           | breeze      | do               | do          | NE              | do          | NE                 | breeze      | do           | do       | do        | do       |
| 26                | do           | do          | do               | wind        | do              | do          | do                 | do          | do           | do       | do        | do       |
| 27                | do           | do          | do               | breeze      | SE              | breeze      | SE                 | do          | do           | do       | do        | do       |
| 28                | do           | airs        | do               | do          | do              | do          | do                 | do          | do           | do       | do        | do       |
| 29                |              | calm        |                  | calm        | do              | do          | do                 | do          |              | calm     |           | calm     |
| 30                |              | do          |                  | do          | do              | do          | do                 | do          |              | do       |           | do       |
| 31                |              | do          |                  | do          | do              | do          | do                 | do          |              | do       |           | do       |
| Prevailing winds. | N            | airs        | NE               | lgt. breeze | SE              | lgt. breeze | SE                 | lgt. breeze |              | calm     |           | calm     |

OF THE MONTH OF JANUARY, 1835—CONTINUED.

CLOUDS.

| Day           | 6 to 9 A. M.       | 9 to noon. | noon to 3.         | 3 to 6.            | 6 to 9.   | night. |
|---------------|--------------------|------------|--------------------|--------------------|-----------|--------|
| 1             | clear              | clear      | clear              | clear              | clear     | clear  |
| 2             | cirri              | do         | do                 | do                 | do        | do     |
| 3             | clear              | do         | do                 | do                 | do        | do     |
| 4             | do                 | do         | do                 | do                 | do        | do     |
| 5             | do                 | do         | do                 | do                 | do        | do     |
| 6             | do                 | do         | do                 | do                 | do        | do     |
| 7             | do                 | do         | do                 | do                 | do        | do     |
| 8             | do                 | do         | do                 | do                 | do        | do     |
| 9             | do                 | do         | do                 | do                 | do        | do     |
| 10            | do                 | do         | do                 | do                 | do        | do     |
| 11            | do                 | do         | a few cirri        | hazy               | do        | do     |
| 12            | hazy               | hazy       | cirri              | cirri              | do        | do     |
| 13            | cirri              | strati     | do                 | clear              | do        | do     |
| 14            | clear              | clear      | clear              | do                 | do        | do     |
| 15            | hazy               | hazy       | do                 | do                 | cumuli    | do     |
| 16            | do                 | clear      | do                 | do                 | clear     | do     |
| 17            | clear              | do         | do                 | cirri              | do        | do     |
| 18            | cirri              | cirri      | cirri              | clear              | do        | do     |
| 19            | do                 | do         | do                 | do                 | do        | do     |
| 20            | strati             | do         | do                 | do                 | do        | do     |
| 21            | do                 | do         | do                 | cumuli             | do        | do     |
| 22            | do                 | do         | do                 | clear              | do        | do     |
| 23            | {cirri & cumuli}   | cumuli     | nimbi              | cumuli             | cumuli    | cumuli |
| 24            | hazy               | do         | clear              | clear              | clear     | clear  |
| 25            | cirri              | clear      | do                 | do                 | do        | do     |
| 26            | do                 | cirri      | cirri              | cirri              | do        | do     |
| 27            | do                 | do         | do                 | do                 | do        | do     |
| 28            | cumuli             | do         | cumuli             | cumuli             | overcaste | do     |
| 29            | {cumuli & stratus} | hazy       | {cumuli & stratus} | {stratus & cumuli} | clear     | cumuli |
| 30            | cumuli             | do         | do                 | do                 | do        | clear  |
| 31            | do                 | do         | do                 | do                 | do        | do     |
| pre-vail-ing. | clear.             | clear.     | clear.             | clear.             | clear.    | clear. |

Electrical state of the clouds seen by their spreading out on approximating each other.

With the exception of the last six days of this month, there was dew every morning: on the 26th instant, thunder was heard.

W. GILCHRIST, Assistant Surgeon,  
3d L. I.





# MADRAS JOURNAL

OF

## LITERATURE AND SCIENCE.

No. 8.—*July*, 1835.

SKETCH OF THE LIFE OF THE RAMOOSSEY CHIEF  
OOMIAH NAIK, KHOMNEY OF POORUNDUR.

*Continued from Number 7.*

1.—*A Sketch of the History of the Ramoossies residing in the Sattarah Territory and in the Poona and Ahmednuggur Districts—By Captain Alexander Mackintosh of the 27th Regt. M. N. I. Commanding Ahmednuggur Local Corps.*

### CHAPTER XVI.

A detachment arrives from Ahmednuggur.—Troops in motion at Aurangabad, in consequence of the reports circulated by the friends of the Bund.—Oomiah addresses a proclamation to the natives of India, calling on them to destroy the Europeans.—The Bund go to Paigum: several of the Naiks seized.—Oomiah and his adherents greatly alarmed, secret themselves in the ravines.—They are discovered in the hills near Pinggory, and attacked.—They retire by Hurgooda, wounding several of the inhabitants.—Re-occupy their old haunts south of the Salpie ghaut.—Several parties of Sibundies employed under Patells.—The chiefs of the Bund accuse persons at Poona of causing the disturbance.—The greater part of the troops withdrawn.—Government express their high approbation of the proceedings against the Ramoossies.—The Bund occupy the part of the country where the detachments, 8th regiment, were posted.—Many fruitless attempts made to surprise Oomiah.—Bappoo Singh employed.—A skirmish between the Bund and some of the inhabitants near Green.—A detachment of the 11th regiment attacks the Ramoossies.—The Bund so harassed that they put one of their own men to death, as he was unable to accompany them.—They cross to the south of the Neera river.—Kalloo and his cousins rejoin the Bund.—They offer to destroy the chiefs, but are forbidden to do so.

On the 12th February, two hundred men under Captain Livingstone, of the 8th regiment, arrived from Ahmednuggur; these men were posted in the country north and east of Jejoory, with directions to keep up a communication with the Mamlutdars (the native collectors) of the districts of the southern boundary of the

Ahmednuggur collectorate, and to be guided in their proceedings according to any information that they might receive from them.

About this time, a body of horse and foot had shown themselves on the boundary of the Ahmednuggur district, adjoining the Nizam's frontier, and a considerable detachment of Cavalry and Infantry marched in consequence from Aurungabad. Oomiah appeared to be ubiquity itself, for it was insisted that he was every where at the same time—in the Satara territory, in the Konkan, in the Nizam's districts, and in the Nuggur collectorship. His numerous well wishers, aware of the advantages it would be to him to circulate such reports, were most industrious in propagating them, both for the purpose of harassing the troops and annoying the Government. It having become known that an application had been made to head quarters, that some of the detachment should return to their stations to assist in overawing, or acting against those who might show any disposition of favouring or aiding the proceedings of the Ramoossy Bund, a letter was written to Government, setting forth, "that notwithstanding the threatened disturbances at a distance, it seemed the wisest plan to keep the troops concentrated in the Poona district, and to strike first at the root of the evil in the Poorundur hills, in order to eradicate it effectually." Government in reply wrote—"The detachment will not be withdrawn: unity of action and command seems essential to success, and these should be vested in Captain Mackintosh, and our means not weakened by our undertaking enterprises distant from him."

The gang proceeded now to the banks of the Bheema, moving gradually down the river; on the 16th February, while they were at the small village of Baboolsur, Oomiah, Kristnajee, and Bhojajee, with the assistance of two or three others, dictated to a Brahmun whom they

employed as a scribe, a long declaration addressed to the Rajahs, Jageerdars, Enamdars, and all the inhabitants of Hindoostan, written in the names of Oomiah and Bhojajee, of the fort of Poorundur. This demoniacal production is too long, and there is too much repetition to give a translation of it. It sets forth, that it is by order of Government that the proclamation is published to the whole of the inhabitants of Hindoostan. All rajahs, nobles, and all other persons, are directed to destroy the European gentlemen and soldiers, wherever they can find them; and that such persons as are most active in this work of destruction, shall be presented with Jageers, Enams, and money, by the new Government. It is strongly recommended to all persons who have been deprived of hereditary rights and emoluments, to make themselves useful on the present occasion, that their rights might be restored to them. The whole of the population of Hindoostan is called upon to rise simultaneously, and cause a general uproar and confusion. The Infantry and Cavalry in the British pay are told to withdraw their allegiance from the Europeans, and to seize them, and that if they act contrary to this proclamation, the new Government will punish them. The property belonging to the Europeans to be plundered and destroyed. All treasuries to be plundered, and no person is required to render any account of what falls to his share. No revenue is to be paid to the Europeans. Such villages as pay revenue contrary to the orders given, shall be destroyed. Terrible imprecations are called down on the heads of all Hindoos and Mussulmans that will not conform to the spirit of the proclamation. It further stated, that it is declared in the Shastres that the reign of the Europeans is at an end. That they are to be exterminated, and a new and just reign is to be established.

The Naiks, at the time they published this proclama-

tion, must have been well aware that it would be little attended to; in fact, it may be considered as an act of desperation on their part, fully indicating the helplessness of their situation, for they could not expect to accomplish more than an attack upon some of the treasuries.

The Bund proceeded easterly with the intention of taking some rest in the country round Perinda, but they found themselves surrounded here by various detachments, and learned that Essoo Neekary, one of the chief ringleaders, had been seized near Baramutty, and that Amrootah Naik, a brother of Oomiah's, (who had fled after the skirmish at Mandurdeo,) had also been apprehended near Perinda. The gang therefore crossed the country rapidly towards the hills southeast of Phultun. Oomiah now gave his long proclamation to a Dhere that had acted as their guide to the banks of the Neera, with strict orders to deliver it to the Patell of his village, who was to obey the injunctions laid down in the document.

The Patell upon receiving the proclamation very properly carried it to the Kamavisdar of Indapoor, who forwarded it by post, viâ Sassoor, to Poona. It was long doubted whether Oomiah really had prepared and put forth this paper, and no certain information on the subject could be gained until he was apprehended. When he was questioned respecting it, after he was seized, he said, laughing, that he had kept it some days by him, and then gave it to the Dhere, adding that it was nothing more than a frolic.

Oomiah having had some conversation with the Patell of a village in Phultundesh, when he was proceeding south, mentioned that it was his intention to go in the direction of Vissallgur and Sawunt wary—that he could not remain in this part of the country, while so many detachments were in pursuit of him. This information was in a few days made public, and without doubt pro-

duced partly the effect which Oomiah anticipated, of drawing the troops in the direction of Vissallgur; however a few only of the detachments in the Satara country moved south, and two of the light ones from the Poo-rundur district. A detachment advanced from Kalapoor, and another from Dapoolie, in the Konkan, towards Vissallgur, to oppose the gang should they make their appearance there, or to overawe the discontented that might be anxious to befriend them. .

Shortly after this, it was confidently reported that the gang had gone into the Bheema Shunkur and Joonere hills, with the view of descending into the Konkan to plunder and to incite the Kolies\* to rise and to obtain for themselves such terms as Oomiah had formerly extorted from Government.

A detachment marched from Bombay to check any inroads from the upper country, and to preserve order in the northern Konkan. The distribution of the reward for the apprehension of the Naik Essoo Neekary, produced a considerable reaction in our favour. The people did not expect that Government would have disbursed this money, (although such was the terms set forth in the proclamations,) and several had the honesty to state, that such was the general impression, for neither did they think that Government intended to punish Oomiah, as he was always permitted to do as he liked.

Several men now having more confidence in our proceedings, tendered their services to assist in seizing Oomiah, provided a promise was given to them in writing that Oomiah would be punished should he be apprehended. These men were assured that if Oomiah was seized by them, he should not return amongst them, and that no opportunity would ever be permitted to him

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\* The poor deluded Kolies had twice previously tried Oomiah's scheme, but were forcibly put down, and learned such a lesson on the occasion, that they are not very desirous now to repeat similar attempts.

to exercise his revenge on them ; that they would secure to themselves the reward, and that Government would always regard them with favour and kindness, but that no paper of the description they required could be granted.

The reward offered for the apprehension of Oomiah, did not seem sufficiently large to tempt persons to volunteer to seize him, or to give such certain information as might lead to his seizure by the troops.

It is quite manifest that when a reward is to be held out for the seizure of such an influential person, it is necessary to consult the feelings of the people, and to work on their imaginations. The amount of the sum should be such, as to overbalance in their estimation the chance of risk and danger in which they are likely to be involved.

When the gang reached the Mhadeo hills, in the end of February, the twelve Hetkurries who remained with them, represented that they could not endure the incessant work and long fasting to which they were subjected, and that they must be allowed to return to their homes. Both Oomiah and Kristnajee now told them, that they should receive for the future double pay, (twelve instead of six rupees a month,) and although there might occasionally be a scarcity of food, they hoped the Hetkurries would not despond ; that ere long good fortune would return to them, and matters be settled as formerly, when their great and valuable services should be gratefully acknowledged and remembered.

On the morning of the 22d March, the gang were discovered in the hills between Pinggory and Sakoordy. Information was conveyed to the detachments at Dound and Pangara. These hills are steep and covered with prickly-pear bush. The party from Pangara although close, unfortunately ascended a ravine too much to the northward. The Dound party came up with the Ra-

moossies, who had proceeded along a narrow and rugged ravine, and by a circuitous route had taken up a position on the face of a steep part of the hill fronting and overlooking the ravine by which the sepoy were advancing. The gang by rolling down stones (with which these hills are covered,) and keeping up a fire from their musketry, completely checked the advance of the sepoy. One private was much hurt from blows he received from the stones, and two others were slightly struck with matchlock balls. One of the most active men of the gang was shot through the thigh, but his friends carried him off.

Oomiah repeatedly called out to the sepoy not to follow him, that it was not his wish to molest them—why did they not remain quiet? that they were receiving two and half rupees additional allowance monthly, that he was only struggling for the purpose of obtaining something for himself, and why should they interfere—that it would be much better for them to remain quiet.

The inhabitants of the villages in the vicinity showed a great desire to aid the troops on this occasion; the gang however retired before any reinforcements could join the detachment, and proceeded along the hills in the direction of the village of Hargoodah. On their route they met some of the villagers in the hills, and Oomiah determined at once to check this rising disposition on their part to aid the Government. Accordingly, having overtaken a man belonging to Purcenchy, they desperately wounded him, (he died during the night,) and then entered the village of Hurgoodah. The greater part of the men were absent in the hills. The Naiks now asked the few whom they found in the village, how they dared to act as they lately had been doing, in giving information against them, and in giving assistance to the Government troops. The Ramoossies said they should punish them severely, and from abuse they pro-



ceeded to blows, and wounded ten of these poor men, several of them very severely ; they burnt their grain, and two or three houses, then moved rapidly through the hills towards the Neera, after which no intelligence could be obtained respecting their movements. It appears they retired to their old haunts in the deep ravines, distant about two miles from the village of Peempoory Thorla, (the great,) a few miles south of the Salpie ghaut.

While the Bund remained near Peempoory they procured supplies from some of their friends in the village. Oomiah sold several gold and silver ornaments during his stay here, to pay for the supplies. Early every morning he dispatched two Ramoossies to an adjoining hill to watch the approach of any troops. The Ramoossies returned in the evening, and a picket of Hetkurries took charge of the watch during the night. Lieutenant Hartley's detachment from Solesey, and Lieutenant Clark's from Salpie, frequently passed close to them. Towards the end of April, they came to the resolution of attacking Lieutenant Clark's party posted at Salpie. Their plans were arranged, when they began to reflect, that the advantages likely to accrue from such an attempt appeared uncertain, and that as the sepoys' muskets were always loaded, some of the Ramoossies would certainly fall, and the plan was eventually abandoned.

Several parties of Sibundies were now employed under active intelligent Patells, a Havildar with a detachment of sepoys being attached to each of these parties. The light moving detachments, and these parties of Sibundies, continually scoured the country in all directions, but the severe and unfortunate example Oomiah had made of the poor Hurgoodah inhabitants, completely deterred the villagers from giving any intelligence of the movements of the Bund. Some of the Ramoossy Naiks were employed at the same time, notwithstanding their attachment and admiration of Oomiah.

In a public letter, written for the information of Government, it was mentioned that various attempts had been made by the relatives and friends of the chiefs of the Bund, to throw all the blame of the present disturbance on persons high in the public offices at Poona, and other influential individuals in that capital.

It was natural to expect, that these people would exert their utmost arts of cunning and intrigue, to effect their purpose in the present instance as they had done before. They persisted for nearly two months in making the most insidious proposals, and asking for permission to seize the persons alluded to. To this it was replied, that they must give in writing the names of those whom they declared to be the instigators of the present insurrection, and that the information should be immediately communicated to Government, that these persons might be apprehended, brought to trial, and punished, if convicted; but at the same time it was carefully explained to them, that Oomiah and his friends were much mistaken, if they entertained the slightest expectation at present of effecting any arrangement, as they succeeded in accomplishing in the former Bund—for, admitting the conviction of the persons accused in Poona, it would not protect Oomiah and his associates from the consequences of their misconduct whenever they were caught; or should they deliver themselves up, they would be brought to trial, and would be dealt with according to law.

The near approach of the monsoon, and the expense and inconvenience attending the employment of so large a force as that in the field, induced Government early in the month of June, to determine to withdraw the troops employed against the Ramoossy Bund, with the exception of three hundred men, who were to be disposed of, so as to check as much as possible, any acts of depredation.

Government had repeatedly expressed its high approbation of the mode in which the operations had been projected and carried on, and of the active and zealous exertions of the troops; whilst it was of opinion that, from the great number of the gang that had been seized, its strength and spirit were completely broken, and judging of Oomiah's general character, that it was not likely he would ever be seized by the military.

On the other hand, Government were still urged to keep the troops out, as during the rains the chances of overtaking the gang would be greater, owing to the difficulty of their effecting the passages of rivers and nullas, and from the circumstance of there being a greater probability of tracking them in the wet weather.

It so happened that the monsoon rains fell very scantily this season, and the gang contrived to pass the months of June, July, and August, in the part of the district north and east of Jejoory, which had been occupied by the detachments of the 8th regiment, now returned to Ahmednuggur.

The exertions of those that remained, were by no means slackened in consequence of the seemingly diminished chance of ultimate success. Many attempts were made during this time to surprise Oomiah, particularly by Captain Luyken, Lieutenant Long, and two parties of the Nuggur Police corps; on one occasion Lieutenant Long made a rapid and fatiguing march, which he continued for the greater part of two nights, and the intervening day, in the expectation of coming up with the gang; but it had moved off some time before he reached the place. A strong detachment of Horse\* and Irregular Infantry was sent by His Highness the Rajah

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\* The Rajah had long before this placed a body of Horse and Sibundies at our disposal, to be employed within the Satara territory against the Ramoossies; and his Mamlutdars and other officers were ordered to lend us every assistance, and to attend to such directions as might be sent to them relative to the Band.

of Satara to Sassoor to co-operate with us. The Ramoossies, however, changed their ground constantly, and no detachment could move or prepare to move without their knowledge.

Early in the month of April, a man named Bappoo Singh, of Paigawn in the Ahmednuggur district, who had been placed under restraint for having rendered assistance to the Ramoossies, was set at liberty on giving good security for his appearance. This man's character being well known, hopes were entertained of his being capable of performing some great service for us. A few days afterwards, two Ramoossy prisoners were set at liberty, and directed to remain with Bappoo Singh. He had previously become acquainted with a cousin of these Ramoossies, an active, powerful, and enterprising man, named Kalloo, who had quitted Oomiah after the skirmish at Mandurdeo on the 18th January.

Bappoo Singh was strongly recommended to exert himself in winning these men over, and to persuade them to rejoin the Bund, and to avail themselves of some favourable opportunity for capturing Oomiah. They were furnished with passports drawn out in Mharatta and English, and they promised to do their best to realize the expectations that were entertained. The employment of these three men was kept as secret as possible. They had a cousin named Nana in the Bund, who had considerable influence with Oomiah. By means of their women, they opened a communication with their cousin Nana. He said in reply, that upon Kalloo and the other two Ramoossies rejoining the gang, he would agree to give his assistance to any reasonable plan of theirs.

Bappoo Singh was posted at Jejoory with some Sibundies, and the leaders of the gang came to the determination of attacking him ; they had learned that he had agreed to act against them, and that it was on these

terms he had been liberated. Nana Ramoossy, however, remonstrated with Oomiah and the other Naiks on this occasion, and urged that Bappoo Singh had assisted in procuring the release of his two relations from confinement, for had they been sent to Bhore, they would have been executed ; and that he would not consent to aid to injure a man to whom he and his relations were under such obligations—if however they were determined to attempt to surprise Bappoo Singh, that he would remain in the jungles near Kotley (three miles from Jejoory) until they should return. This argument had the desired effect, and they gave up the proposed plan of marching to Jejoory.

The troops were posted as follows for the rainy season ; Captain Luyken at Sewry, Captain Kingston at Keekvy, Lieutenant Anderson at Pinggory, Lieutenant Long at Sonoury, and Lieutenant Loyd at Soupah, with several parties of the Ahmednuggur Police corps moving about the district.

The gang moved now more to the eastward and beyond the range of the different detachments. Having obtained provisions from the village of Greem, east of Patus and about twelve miles north-east of Soupah, on the 20th August, the Patell of Greem communicated this circumstance to the detachment at Soupah, and to the Thanna of Row Peeplegawn.

The Shaikdar (one of the Mamlutdar's assistants, and in charge of about fifteen villages) of Bheemthery immediately prepared to go in search of the Bund. He assembled about fifty of the inhabitants of the nearest villages, who armed themselves with sticks, swords, and some matchlocks, and commenced their march. The Bund were close to Greem, when some one of the gang observed them, and called out that a " party"\* was ap-

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\* The English word " party" is always made use of ; it appearing more expressive to the Ramoossies and others, of a small armed body of men, than any term of their own.

proaching. It was noticed that the men advancing looked like villagers. Some one said they might be sepoy in disguise. Bhojajee Naik, who is able to move at a rapid rate on his hands and feet (all fours,) proceeded to reconnoitre. He soon returned, having discovered that they were only ignorant villagers. It was proposed that they should secret themselves in a nulla close to them, with the intention of amusing themselves with the Koonbies. The Shaikdar and his followers looked about in every direction in hopes of finding Oomiah, and when they approached the nulla, the gang unexpectedly rushed out on them and put them to flight in a few seconds. One of the Shaikdar's party was killed and two wounded; the Ramoossies pursued them to the village of Greem, when some horsemen and sepoy were descried advancing in their direction, upon which the Bund retired into some strong ground. This occurred at 8 o'clock in the morning. The detachment advancing towards them proved to be twenty men of the 11th regiment under Havildar Gunness Singh, and eight of the Poona horse. The men anxious to surprise the Ramoossies, were fatigued by their rapid march, and they did not all come up at once. As the detachment approached the Bund, the Ramoossies asked the sepoy why they came after them, that the Bund had no wish to disturb them, why therefore run the risk of being shot, for if they (the sepoy) attack them, they must defend themselves. Some of the sepoy told them to stop and not run away. The sepoy were desired to keep at a distance, and Oomiah remarked that they enjoyed good pay, and that as there was no Officer near, why should they expose their lives by attacking them. A sepoy called out to Oomiah that they had come to cut his head off; upon which Oomiah replied that his head rested on the palm of his hand, that any body might have it who could take it. The Havildar was

severely wounded, and unfortunately the detachment was left without a leader. The gang had now made up their minds to make a furious attack on the sepoys, but a Ramoossy and a Hetkurry having been badly wounded, they thought it more advisable again to retreat. They retired somewhat in the form of a circle, taking every advantage of the strong ground. The detachment followed them till late in the afternoon. The horsemen do not appear to have acted with any spirit in this affair, as the ground frequently afforded them opportunities of charging the Ramoossies.

The detachment from Jejoory marched during the night and proceeded in search of the gang—Oomiah determined to cross to Phultundesh and visit his haunts at Pcempoury.

This skirmish deranged for the time the plans of Kalloo and Nana Ramoossies, employed by Bappoo Singh, as their friends at the village of Jogoury had prepared an entertainment for Oomiah on the evening of the 21st, of which he had promised to partake ; on which occasion it was determined if possible to seize him.

The gang was now much pressed by the troops, and previously to their crossing to the south bank of the Neera, they considered it necessary to sacrifice one of their party. This man's name was Appah Kanarah. The unfortunate victim had suffered much from the *Dracunculus* in both his legs, and had become so greatly emaciated, that the members of the Bund had been obliged to carry him along with them for a period of two months. A Ramoossy of Waiedesh, and another from a village near Sassoor, were employed to terminate his existence, and they buried his body in the jungle. All of the gang were bound over never to divulge this circumstance. Oomiah upon being questioned on the subject stoutly denied the murder, and accounted for

the man's death in various ways, but subsequently when the particulars were described to him, he admitted that the man had been destroyed.

It must be observed here, that Kalloo Ramoossy, when searching on one occasion for the gang for the purpose of rejoining it, shortly before the skirmish at Greem occurred, was unfortunately seized at the village of Mandūr by a party of the Nuggur Police corps, as being one of the insurgents, and when he was obliged in consequence to shew his passport, the sepoy's would not credit his statement; and concluded that he must have obtained the pass by some fraudulent means; he was ordered to be set at liberty the same night, and no questions to be put to him. But the circumstance became somewhat public, that Kalloo had been seized and released, and it was conjectured therefore that he must be in the employ of the Sirkar.

Kalloo and his two cousins joined the Bund in Phul-tundesh, and having framed a plausible story to tell Oomiah, they showed him and Bhojajee their passports, adding that the only chance left them of escaping death or transportation, was by offering to seize the leaders of the gang, and that they never intended, or never could perform so perfidious an act. Again they saw that their only chance of safety was by continuing with the Bund, and as a proof of the truth of their statement they produced their passports. A communication was kept up with them through the aid of some of their women, and it appears that they were closely watched by Oomiah and some others, and indeed that they had reason to feel somewhat alarmed. They were pressed to hasten the apprehension of the ringleaders; upon this they expressed their readiness to destroy them, if orders were given to them to that effect; this they were peremptorily forbidden, and directed to accomplish the object in the manner that had been pointed out to them.



It having been announced that it was intended to withdraw the greater part of the detachments in the field, employed against the Ramoossies, on the 8th of October, a letter was addressed to the Government, requesting that the detachment might be permitted to continue for some short time longer in pursuit of the gang, as measures were in progress by which it was hoped that Oomiah might be taken. Accordingly an order that had been issued for the recall of the greater part of the detachment, Government was pleased to suspend for the time.

It is to be noticed, that several of the prisoners had been executed, and the impression made on the public mind was such as so severe an example might be expected to produce. Still a portion of the well disposed, and others of the inhabitants who had shown a disposition to aid us during the operations against the Ramoossies, felt a considerable degree of uneasiness and distrust, in consequence of the reports in circulation that the troops were to be withdrawn.

The Hetkurries had been latterly pressing Oomiah for their pay, and for permission to quit the gang and to return to their homes, being heartily tired of the dangers and privations to which they had been so long exposed.\*

Bhojajee proposed to Oomiah to plunder some rich man's house, in order that he might obtain means to satisfy the present demands of the Hetkurries, but this counsel was declined and the gang proceeded to the Bhoze ghaut, having sent in advance two men to obtain information respecting any treasure that might be pass-

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\* One of their number, who had been severely wounded and taken prisoner, had a very narrow escape, as the Ramoossies were about to cut off his head, (according to their usual custom on such occasions,) when a brother interfered (who placed him under some bushes,) and said that he would recover sufficiently to join them in two days at the Khurry Puthar. By this means, the man's life was saved.

ing between Bombay and Poona. These men returned without gaining intelligence of any remittance of money being on the road ; they learned however that the Ramoossy prisoners who had been sentenced to transportation, had descended the ghaut for Bombay two days previous to their reaching the place.

Oomiah did not appear much disconcerted by this unwelcome information, and remarked that the removal of their friends to Bombay was of no importance, that Kristnajee and Wittoo Naiks would manage to get the prisoners brought back to Poona, and that all of them would ultimately be pardoned, as had been the case on the termination of the former disturbance.

From the vicinity of the Bhore ghaut, they proceeded along the hills ; afterwards descended into the Konkan and continued sometime in the neighbourhood of Jambool Para. The Hetkurries were now more anxious than ever to obtain leave to depart, but Nana and Kalloo urged them to remain, and to rest satisfied for the present with Oomiah's assurances, and promised they would exert themselves in their behalf.

These two Ramoossies had, in a cursory manner, alluded to the purport of the Government proclamation, in order if possible to discover what were the Hetkurries' sentiments on the subject ; but the Ramoossies did not consider it safe to confide their intentions to them. Nana and Kalloo conceived that by pretending to assist Oomiah in persuading the Hetkurries to continue with the gang, they might gain his confidence and obtain more influence over him.

Towards the end of November, Oomiah quitted the Konkan, and on the 27th, in the evening, entered the village of Oulus, five miles from Moolsey. A Brahmun Jossy and the Patell were seized by the gang, and roughly handled, and called upon to pay a contribution of five hundred rupees. The gang entered the

Brahmun's house, and whilst food was preparing for them, Oomiah made the Jossy write two letters, one to the Governor, and the other to the collector at Poona. The letter to Mr. Giberne was not addressed in his usual respectful manner. He wrote in a high and dictatorial tone, setting forth that he had been unjustly treated, and that he was forced to fly to save himself; that although troops had been employed from Ahmednuggur to Sawunt Wary (in the southern Konkan) to seize him, they had completely failed in all their attempts. He therefore recommended that the troops should be withdrawn, and that he would then remain quiet; but that there would be no peace until a treaty was established between him and Government. He added also, that he wished an answer to be sent through Kristnaje Naik, &c. and that he would allow the collector eight days, and the Governor fifteen days time, to return a reply to his communication. When he and his adherents were threading the dense and solitary fastnesses of the Syadry range of ghauts, entertaining wild ideas of liberty and power, and had dispatched his threatening letters, little did he contemplate the sad catastrophe that awaited him at the expiration of the period which he had named, for he was a prisoner in irons at Sassoor.

The Jossy had sent off to a village four miles distant, to inform a Jemadar and some Sibundies to come to Oulus without a moment's delay; the messenger did not mention that the Bund were at Oulus. The Sibundies reached the place about 9 p. m. On approaching the village, two of the Ramoossies who were on the watch instantly ran to inform Oomiah that a detachment had arrived. The gang lost no time in proceeding to an eminence outside the village, taking the Brahmun and the Patell with them. Jemadar Shaik Ghassy repaired with his small party to the Brahmun's house, and the

gang ignorant of this, accused the villagers of endeavouring to frighten them by spreading false reports. The Ramoossies now entered the village, and when they approached close to the gateway of the Brahmun's dwelling, it was suddenly thrown open and several matchlocks fired by the Sibundies at the gang. This staggered them at first ; they advanced notwithstanding several times to rush into the building, but as the Sibundies kept up a fire upon them, they resolved on quitting the place, uncertain what might be the strength of the detachment. No injury was done to either party, although the gateway was somewhat studded with balls : but to be revenged on the inhabitants before they quitted the place, the Ramoossies burned several houses and a quantity of grain.

In a few days several detachments of the Ahmednugur Police corps and Sibundies searched the surrounding hills, and one detachment succeeded in tracing the route of the gang to the south side of the Singhur fort ; Cheemun Singh, a brother of Bappoo Singh's, had been detached with a party of Sibundies to endeavour to open a communication with Nana\* and Kalloo. It so happened, that on the night of the 13th December, these two Ramoossies, with their two cousins, obtained leave from Oomiah to pay a visit to their relations in the small village of Bazarwary—Oomiah sent his friend Pandoo Naik with them to watch their conduct ; Cheemun Singh had been in communication with several of the Bazarwary Ramoossies, and upon the arrival of Nana and Kalloo, Cheemun Singh was sent for, and notwithstanding that they were watched, they contrived to have a short interview with him. He told them that their conduct appeared suspicious, and that doubts were en-

\* A twin brother of Nana's left Sassoor a few days before this to communicate with him, and to hasten the capture of Oomiah.

tertained at Sassoor of the sincerity of their intentions. Upon this, both Nana and Kalloo declared that they were as determined as ever to carry their plan into execution, but, that Bhojajee and Oomiah were so vigilant, suspicious, and intractable, that they had little influence over them. They told Cheemun Singh to remain as near to them as possible, and he to mention to the officer at Sassoor that it was their determination to make an attempt in a few days, either with his (Cheemun Singh's) assistance or by themselves. These Ramoossies (at least Nana) had entertained considerable doubts as to the consequence of seizing Oomiah, but they had now just been informed by their relations at Bazarwary, that Es-soo Neekary and others of the gang had been executed at Jejoory, and this gave them confidence in our proceedings. Nana, however, wished to have his wife released, (she was a prisoner in one of the Punt Suchew's hill forts). Cheemun Singh pressed them to fulfil their promise, and mentioned that he and his brother were directed when at Sassoor, to explain fully to Nana and Kalloo, that all reasonable demands on their part (of the Ramoossies employed with them) would be complied with. They proceeded to rejoin Oomiah, to whom and the other members of the gang, they related the particulars of the executions at Jejoory. This was a most alarming blow to all of them, yet Oomiah, in his usual style of confidence, observed that none of his relations had been executed, which was a clear proof that it was neither the intention nor wish of Government to punish him, and that matters must ultimately be arranged to the advantage of all parties, but that they (the members of the Bund) must have patience, and submit quietly to his advice.

Oomiah was aware of these executions while he was in the ghauts, and heard the reports of the intention to withdraw the troops, but all these circumstances were

communicated to him by a female, and were kept an entire secret and not mentioned to the rest of the gang.

On the 14th December, Nana suggested quietly to the Hetkurries to press Oomiah for their arrears of pay. In the evening they loaded their muskets, and accordingly beset Oomiah, declaring that their pay must be given to them; they threatened that unless their demands were otherwise complied with, they would shoot him and afterwards destroy themselves. since it was quite clear that Government was fully determined on punishing all of them that were seized. Oomiah again expostulated with them, recommending forbearance and patience, adding that he would give them some money in a few days. At this time, they were in the hills about four miles from Bhore. Oomiah consulted Nana with respect to what he should do under existing circumstances. He told Nana at the same time, that Bhyroo Koodly,\* the son-in-law of Joggoo Sinda of Ootroolly, (one mile from Bhore,) had some property of his, worth about one hundred and fifty or two hundred rupees. That Oomiah should thus consult them, was precisely the object which Nana and Kalloo had been so long endeavouring to effect, since it would enable them to put their plan of seizing him into execution; and as they were well acquainted with Joggoo Sinda's family, they strongly recommended Oomiah to demand the money from Koodly, and that he could then quiet the Hetkurries.

It was known that Joggoo possessed some property, and Oomiah said that probably he would advance them a few hundred rupees, and it was settled if they did not succeed in obtaining money at Ootroolly, that they must plunder some rich man's house. However, Nana observed that he was inclined to think that they would

\* This Bhyroo is an inhabitant of Sassoor, and was employed by Oomiah during the first Bunl in disposing of the gold and silver ornaments which came into his possession.

get sufficient for their present wants at Ootroolly, and it was therefore arranged that they should proceed to the village that night. This was the 15th December.

Oomiah selecting his cousin and old friend Bappoo Soleseykur and six other Ramoossies, with Nana, Kalloo, and Laroo, proceeded to Ootroolly.\* Upon arriving within about eight hundred yards of the village, Oomiah directed Nana and Kalloo to go to Joggoo's house, to tell Bhytoo Koodly that he (Oomiah) was very anxious to consult him about procuring some money, and these men proceeded to the village, but in the first instance they went quickly to the Dherewary, and dispatched two Dheres with speed to Serwell, to inform Cheemun Singh that they had seized Oomiah and Bhojajee, and request him to join them with all speed. They now went to Joggoo Sinda's house. The door was fastened, yet Joggoo and his four sons recognised Nana and Kalloo's voice, but as they had been so long with Oomiah, the family became extremely alarmed, thinking that it was the Bund come to plunder them. They were presently induced to open the door, finding that there were only two Ramoossies, Nana and Kalloo, who now told them that they had brought Oomiah close to the village, and that they were determined to seize him, but that they wished Bhyroo and Joggoo to assist in executing their plan. The members of the family still much alarmed and perplexed, told the two Ramoossies that they must consult some others of the inhabitants. Several persons being assembled, it was deliberated whether they had not better seize Nana and Kalloo at once, and convey them to Bhore.† Upon which it was

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\* Before quitting the hills, to remove all suspicion of treachery, Kalloo's cousin Wittoo was left with Bhojajee and the rest of the gang, seventeen in number.

† The villagers had previously sent the village barber to Bhore, to ask whether they should seize Nana and Kalloo. It is to be recollected, both these Ramoossies with many others, had been obliged to fly from Bhore

remarked by one of the Sindas, that the Ramoossies had passports in Mharatta and English from the officer at Sassoor, so that it would be dangerous to seize them, and on the contrary much more prudent to assist them in seizing Oomiah. Bhyroo and Joggoo were afraid of taking an active part in the affair, both being apprehensive that the Bund might seize them and force them to pay a heavy ransom. A son of Joggoo's therefore agreed to personify the father, and the village Koolkurny to represent Bhyroo; Nana and Kalloo having supplied themselves each with a rope, accompanied by the two men, approached a hedge a short distance from Joggoo's house. Here the two villagers sat down, and were instructed to rise when Oomiah advanced near them, to salute him, and then to resume their seats. Their faces were covered to prevent their features being seen. The Ramoossies proceeded to inform Oomiah that they had experienced great difficulty in persuading Bhyroo and Joggoo to quit their houses, as they feared that it was the intention of the gang to extort money from them, and that they would not come beyond the hedge close to the village. This was about 10 P. M.

Oomiah therefore proceeded towards them, accompanied by Bappoo Soleseykur, Nana, and Kalloo. The other six Ramoossies remained with Larroo, Kalloo's brother. As Oomiah approached the two villagers, they rose and saluted him and then sat down, and he and Bappoo also sat down opposite to them. Oomiah held his naked sword across his body on his lap, and as Bappoo was the stoutest of the two, Kalloo instantly laid hold of him, while at the same instant Nana seized Oomiah. They were immediately both well secured

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some time before this to save their lives; and a few months prior to Oomiah's capture, four of these Ramoossies were seized in a foreign village, and the person employed to apprehend them was rewarded by the Punt Suchew, who issued orders to have three of the Ramoossies immediately executed, and the other to be imprisoned in a hill fort.



with ropes; during this time Oomiah shouted and called loudly for assistance. A messenger was now dispatched to Bhore for some Sibundies, and Kalloo went to ascertain how Pandoo and the other Ramoossies were engaged. He met them advancing within about three hundred yards with their uplifted swords: they inquired the cause of the noise and uproar which they heard in the village. Kalloo told them that some Gheessaries (a description of wandering blacksmiths) were squabbling and fighting amongst themselves. The Ramoossies observed to him, that they thought that Oomiah and his friends had been caught by the Punt's people; Kalloo said, Oomiah is arranging for the money with Koodly who appears backward in advancing all that is required. Kalloo then took these men back to the spot they had quitted, and sat down with them seemingly quite unembarrassed. After having remained a considerable length of time, he said he would go to the village and learn the cause of the detention of the party. Kalloo now remained with some of the villagers near Oomiah, and Nana ran towards Bhore to expedite the arrival of the Sibundies. During Kalloo's absence, the villagers had expressed great alarm lest Oomiah's followers should come and rescue him and punish them. Nana was required to exert all his presence of mind at this time, to guard the prisoners and prevent the villagers quitting the place.

When the Sibundies arrived, Nana and Kalloo requested them to assist in seizing Bhojajee Naik. They replied, that it was quite sufficient to have apprehended Oomiah, and that in seizing Bhojajee some of them might be wounded. They accordingly took charge of the prisoners, and moved towards Bhore, but Nana and Kalloo remained to rescue their two cousins, who might be murdered by the gang when they heard of Oomiah's seizure. They with three Ramoossies went and told

Pandoo and the five others, that Oomiah wished them to come and partake of some food which the villagers had prepared for the party. Having by this means enticed them to the village, they suddenly seized them, saying that resistance on their part was useless, as Oomiah was a prisoner, and that there was a large body of troops at hand. All the Ramoossies however escaped, with the exception of one Kooshia of Kotley. Nana took charge of him and proceeded to join the detachment on the route to Bhore, while Kalloo and Larroo determined to join Bhojajee before Pandoo and the others could rejoin them; Larroo was to communicate and give the signal to Wittoo to quit.

These men being well acquainted with the ground, took a short cut to the hills, and running up to the gang told them that a party of the Punt Suchew's men had tried to surprise them in the village, and they then inquired if any of their party had returned. The gang immediately prepared to move; Kalloo with a view of bringing them in contact with Cheemun Singh's detachment, and to a distance from Pandoo, suggested to Bhojajee that they should advance towards the river. When they had proceeded in that direction about seven or eight hundred yards, they heard Pandoo and another Ramoossy calling out from the spot they had left. "Hollo, Bhojajee, Bhojajee, come back, come back, Nana and Kalloo have seized Oomiah—be quick, be quick." This was a sufficient hint for Kalloo and his two cousins. They instantly took their departure for Bhore.

On the 16th, five different detachments from various directions reached Bhore, and Oomiah with the two other prisoners were brought to Sassoor. Bhojajee with his party did not hear the particulars of his capture for three days. He returned to the Poorunder hills with his followers in great distress and consternation. Pandoo and his friends did not overtake Bhojajee, and wan-

dered about by themselves till Pandoo\* and another were seized.

On the day after Oomiah's arrival at Sassoor,† one of the Hetkurries delivered himself up. He mentioned that the gang were in the greatest imaginable distress, and that they had moved towards the Neera. Several detachments were immediately set in motion after them, but they lost all traces of them in the Salpie range of hills. Bhojajee parted with the Hetkurries when ascending these hills. They proceeded to the Konkan. Only one of them who had become much attached to this Naik, remained with him. The Bund was now reduced to eight persons. A few days after this, they were surprised by the inhabitants of a small village near Nullgoond, and one of the Ramoossies was seized.

The night of the day on which Oomiah was brought to Sassoor, he was questioned very particularly concern-

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\* This Pandoo (a brother of Wittoo Naik's) was always a most notorious character as a member of the gang during the first and last disturbance. He is a tall well made man, extremely active and powerful, and of a wild and savage appearance. He was rash and bold, and of a rather cruel disposition, and much dreaded by the inhabitants of the smaller villages. Ram Singh of the Ahmednuggur Police corps, with his men, seized him, having persuaded some of his relatives to betray him. When Pandoo was discovered and surrounded by the sepoy, he attempted to destroy himself. At the time he was brought to me he was quite furious, and could not be persuaded to give any account of himself. I remarked to him that the ball that passed through his thigh on the 22d of March did not seem to have done him any injury; the scars were at the time visible. Pandoo denied having ever been wounded, and said he knew nothing of the skirmish I alluded to. He had a great dislike to a Brahmun taking his deposition, saying that the Brahmuns were not to be trusted, and when it was read over to him, he doubted much if the Karkoon had read all that he had written. After this Pandoo became quite outrageous, and insisted on being executed in the place where he then was sitting; upon being informed that he might depend on having his case fairly inquired into, he became more tranquil. He was tried and transported.

† Mr. Giberne, the collector, was at Sassoor when Oomiah was brought in as a prisoner, and although he had known him well, he could scarcely recognise him, so greatly was he altered in appearance, having become dark, thin, and emaciated.

ing the attachment of the Hetkurries and Ramoossies to Bhojajee. He in reply stated, that the fidelity and honour of the Hetkurries were great, indeed proverbial, and not to be suspected, but that equal reliance could not probably be placed on the Ramoossies. He frequently declared that he never would have been caught, had it not been for the deception practised on him by Kalloo and Nana. When he afterwards was told that one of the Hetkurries had surrendered himself, he immediately remarked, "The instant the circumstance becomes known to Bhojajee, he will separate himself from them." This turned out to be the case.

That Oomiah was a person of very considerable ability can scarcely be doubted, for without talent and judgment, he could not have secured to himself the respect and terror of the population of the district. By his influence and conduct, he rendered himself very popular among the men of his own tribe, and a portion of the lower orders of the population. Many of the unemployed military admired him for his hospitality, and respected him as a successful leader, while the numerous religious mendicants, and other needy persons who visited Sakoordy, were singing his praises in all directions for his charitable donations to themselves ; for the Vyragies and Goossynes who visited the temple of Jejoory paid their respects to him, and he invariably presented something to each of them, telling them at the same time, that he bestowed all that his means could afford.\* He has frequently been seen to take part of his own wearing apparel or that of his wife's that might be near him, and cast it to some poor and needy creature. Although a reckless and a hardened robber, he had little pleasure in accumulating money, and his wife often remonstrated with him in vain on the subject of his pro-

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\* To the Brahmuns at Jejoory he made an allowance of five rupees a month, which he punctually sent to them on receiving his pay.

digality. His character as a husband was peculiarly correct. He set his face against all licentious conduct. On this account, he had a serious quarrel with his elder brother.

I may observe here, (as it is on record,) that it was the opinion of the inhabitants of the country that Oomiah aspired to empire, and that he kept in view the conduct and line of proceedings pursued by Sewajee the founder of the Mharatta state; however, times and circumstances were very different. He was a man of low caste, but he possessed much shrewdness, intelligence, and activity, and would have proved a most useful partisan to a native government during a period of discontent and confusion.

He has proved, that he possessed the art of warmly attaching his followers to him. It caused them great anxiety and incessant watchfulness to guard against surprise by the troops, as the prisoners always alluded to the distress they suffered, but being naturally a hardy race, they became reconciled to the hardships and dangers that had been thus forced on them. He knew when it was necessary to check their natural impetuosity, or to cheer their flagging spirits. He appears himself, amidst the perils and difficulties by which he was surrounded during the late disturbance, to have displayed great patience, a steady perseverance, with unshaken fortitude. He prided himself much on the dexterity and address with which he always managed his gang, and baffled our efforts to seize him. He remarked one day, that his character in this respect was well known at Calcutta and over all Hindoostan, as well as in England.

Oomiah's widow resides with his mother at Bhewndy: of nine children only two sons and a girl are alive. The eldest boy was with his father till the latter was seized. The second is the smartest of the two.

As the gang during the former disturbance was in the habit of constantly committing robberies, whilst other parties of Ramoossies in different parts of the country were also engaged in plundering, it may be considered extraordinary that Oomiah did not plunder more during the late insurrection, and that the district should have continued so remarkably quiet as contrasted with former times. Partly to account for this, it is necessary to observe, that the only three attempts the gang made to plunder, namely, at Bazarwary, Walla, and at Oulus, they were on each occasion immediately encountered by some of our troops which produced great alarm among the members of the Bund. Oomiah therefore soon learned, that if he ventured to plunder, immediate notice of the place of his retreat would reach some of the detachments to enable them to attack him ; and rather than incur such risk, he considered it more prudent and safe, to restrain his predatory habits and even to submit great privations, and paying at times for the supplies he required. Again, it is to be stated, that shortly after we had commenced operations, ten of the Naiks, and about sixty of the men of his own Bund had been seized, and that between thirty and forty other Ramoossies had been secured, who were concerned in committing numerous durrorrahs. During the time I was employed in the district, there were only two gang robberies committed, and the Ramoossies engaged were apprehended and sent to Poona.

To the Brahmuns and others in the pay of Government he was in the habit of talking in a cavalierly and arrogant manner, neither caring for or respecting them, and when they attempted to check his presumption, he has observed, " You are sadly mistaken ; you certainly don't suppose that I am to be compared to a Brahmun. I am a different sort of person from your Streemunt Bajee Row. I am not to be dealt with in the same

manner. The English cannot drive me from the Poo-runder hills as they hurled Bajee Row from his throne. They tried their strength and skill once against me and they failed. The English are aware of the activity of the Ramoossies, and of the attachment and prowess of my followers. They will gradually grant and concede, rather than quarrel with me."

When the Mamlutdar of the district remonstrated with him and his Naiks, on the irregularities which they committed, and the disrespect shown to his authority, he replied—"Attend to your own duties, we shall attend to ours, what do you mean by reporting matters to Poona—to goad us, and force us to take shelter in the jungles again?"

There have been instances of Oomiah entering the Brahmuns's houses, and they dared not offer any resistance to this annoyance, and he was in the habit of sitting down on the same carpet,\* which to them was very offensive; and whilst talking and joking, he at times used to pat them with his hand. To these prejudiced and intolerant people, such odious familiarity was extremely distressing and disagreeable. The natives high in the employ of Government, he occasionally visited, as well as Jageerdars and Enamdars, and he invariably requested them to provide himself and his followers with some refreshment.

On one occasion, when the Mamlutdar was at Jejoo-ry, he found fault with a man of Sakoordy, for being so backward in paying his rents, and made some allusion to Oomiah at the same time. This man started imme-

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\* During the Hindoo Government a Ramoossy was never admitted inside of the door of a Kuchery, (court); whatever might be his business he was obliged to state it standing at a distance—but since Oomiah had met with so much consideration from the English, he and other Ramoossies took advantage of the circumstance, and people deemed it advisable to show him more attention than they ever dreamed of doing before. Persons of low caste were not allowed to approach the carpets used by Brahmuns in public offices formerly.

diately for his village, and mentioned to his friend Oomiah what the Mamlutdar had said. He, with a large party of his followers, proceeded to Jejoory. Upon reaching the house in which this Brahmun lodged, the Ramoossies were informed that he had just finished his ablutions, and had commenced performing his accustomed worship to his household gods, before he could partake of his breakfast. Oomiah unscrupulously entered the house with eight or ten of his followers, and told them to call the Brahmun. He, somewhat agitated, made his appearance, on this rude summons. The Naik, and those with him, asked how he dared to cast aspersions on his character. One of the Ramoossies also called out, "You had better take care, or probably your body will be found some night without its head." Many explanations were offered, after which Oomiah intimated his intention of quitting, but hinted that he wanted some money. A rupee was tendered, which he refused; he said he must have ten, which sum was presented to him.

The wife of the Brahmun having heard of this unpleasant occurrence, and greatly dreading some evil in consequence of the threat, went to Jejoory to obtain an interview with Oomiah and spreading her sarry before him, said "My husband is your brother, I am your sister, and these children are your nephews and nieces, so pray do not break the bracelets on my wrist.\*" At the expiration of a few weeks, Oomiah came to Sassoor and paid the Brahmun a visit; on taking his departure he asked for a present, but the Brahmun excused himself. Oomiah took his leave, but immediately returned and entered by the rear door of the house, when he was encountered by the host, who asked him what he wanted. He said, "I am come to pay my respects to my sister,

\* Women on the death of their husbands are obliged to dispense with such ornaments



(the Brahmunee,) that she may give me and my followers some food."

I have mentioned the above circumstance, that it may be seen how much Oomiah was dreaded by the district officers; the Brahmuns also, and other persons who possessed property, and residing in unprotected villages and in insecure houses, lived in a miserable state of alarm, constantly expecting a nocturnal visitation from some of his retainers. It is time to close the account of this notorious man's career. The crisis of his destiny was fast approaching. He was brought to trial at Poona before the Judge of circuit; on which occasion he admitted the validity of the charges brought against him, and consequently he was found guilty of treason and sentenced to be hanged. He was accordingly executed, along with two of his comrades, on the 3d of February, 1832. During the period of his incarceration at Poona, a number of persons visited the jail to have an opportunity of seeing him.

I may be permitted to offer my opinion on the conduct of the troops employed in suppressing the late disturbance. I must bear testimony to the very active and indefatigable exertions of all the officers and sepoys, which were highly creditable to them. From the strong nature of the hilly country in which the operations were carried on, and the great difficulty, at times, of procuring supplies in the small and poor villages in the hills, the duty which they were called on to perform became most harassing and fatiguing, whilst they were frequently subject to great disappointment, in consequence of the successful efforts made to mislead them by the propagation of false reports; several of the officers, however, and a large portion of the sepoys, were inured to such arduous service, and all of them seemed actuated by a lively spirit of zeal and enthusiasm. A more than ordinary degree of vigour was consequently

exhibited in the measures that were pursued, whilst a corresponding degree of unanimity prevailed, and a proportionate share of success attended their labours. Mr. Giberne, the magistrate, displayed his accustomed zeal on the occasion, lending all his influence for the restoration of tranquillity in the district, well aware, that this could not be accomplished while Oomiah continued at large.

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## CHAPTER XVIII.

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Government possesses much information respecting the state of the Police.—

A few remarks offered.—The bad effects of an inefficient Police.—The people wish to have some alterations made respecting the punishing of offenders.—The charges against accused persons to be well inquired into, before they are committed for trial.—The necessity of protecting the property of the lower classes.—The efficiency of small bodies of disciplined men.—Assembling corps in large cantonments; the advantages in some respects of doing so doubtful.—The sepoys easily managed.—The necessity of prompt measures being adopted to disperse a Bund.—Employing desmooks to aid the Police.—The irregular division of Pergunnahs.—Proposals respecting the Naiks of the predatory tribes; their pay.—Reductions not advisable; the population of hilly tracts much oppressed.—Mamlutdars; to attend to their characters.—The collector's assistants stationed in the districts; advantages of the arrangements.—Observations respecting the best description of troops to be employed against the predatory tribes.—The character of the Purdessy sepoys; remarks respecting the unemployed portion of the inhabitants, recommend recruiting from the Konkan and Dekhan—with some further observations.

Although Government are in possession of much valuable information on the subject of the Police, and it is one that has been treated in a masterly manner, by others better qualified for the task, still as the peace and happiness of a country (particularly India) must greatly depend on a good and efficient Police, I trust I shall be excused for venturing to make a few observations relative to it. It is to be recollected that in the vicinity of a tract of naturally strong and hilly country, where a

defective and inefficient Police exists, the most uncomfortable feelings of alarm and insecurity are produced among the peaceable and unprotected portion of the community; more especially when they see or hear of formidable bands of plunderers bursting forth from their lurking places, during both the day and night, carrying off the little property of their neighbours, while those who have little or nothing to lose, are often obliged to propitiate the plunderers by a timely offer of a small supply of food to save themselves from cruel treatment. This state of things becomes eventually highly detrimental to the commercial interests of the country, and it is to be borne in mind, that it tends to alienate the attachment and respect of the population from the British Government; for when weighing the advantages and disadvantages of living under our rule, the chief credit the mass of the population are willing to grant us is, that we protect them more effectually from robbers and plunderers, than their own Kings and Governors formerly did, and that in our dealings with them we exact no more rent or tax, than at the time of settlement was stipulated for; and if necessary we even lessen\* our demands,

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\* It is much to be regretted, that the benevolent intentions of our liberal and fostering Government to alleviate the distressed condition of the poor farmers, by granting them remissions when there has been a failure of the harvest, is, however, too frequently defeated by the intrigues of Mamlutdars, Shaikdars, and Koolkurnies, and sometimes of the Patells of villages; many of these poor people rarely benefit, at least to the full extent of the indulgence that was solely intended to be conferred on them. It is to be hoped the spread of education among the lower orders, and showing more consideration to the higher classes, will gradually put a stop to this and many other evils. That it will induce a higher tone of moral feeling among all, and that consequently they will become more spirited and independent; for there is such a disposition to cringe to the will of their superiors, that it is almost inconceivable to what extortion the majority of the poorer description of farmers will submit to, rather than run the risk of displeasing the native revenue officers and Koolkurnies; who possess extensive means of distressing persons who will not bend to their views. To those unacquainted with the character of the Brahmuns, it would seem

whereas the demands of the native Governments were uncertain, and most commonly increased, although levied generally with some consideration to their circumstances.

When we reflect on the wonderful revolution that has placed us as rulers over this extensive country ; and notwithstanding the ready and constant desire of the British government to improve the condition of the inhabitants, it would be unreasonable not to expect to hear the clamorous voice of discontent frequently breaking forth from among those classes that feel most depressed from being in a state of subjection to foreigners. We therefore hear many of the inhabitants complain loudly of the slow and uncertain manner in which criminal justice is administered under our Government, and that the punishment awarded to robbers and murderers is in general much too lenient. There are some grounds for complaint, but the delay principally arises from the extensive duties which our magistrates and judges have to perform, and the difficulty of obtaining the necessary evidence ; perjury and forgery prevails to a very great extent, and delays must occur in passing sentence when the trial apparently has been brought to a close.

With the former Government, the criminal law in general was administered in a summary manner ; as offenders were seized, they were after a slight investigation often put to death, or one or both hands or feet, or probably their nose or fingers, were chopped off ; much depending on the caste and connexions of the prisoner, and the influence of his friends, and the means he possessed of bribing his judges. In those days, Sirdars and Jageerdars had also the power of dispensing justice

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quite surprising to see with what tact many of them manage their intrigues, and the effrontery and boldness with which they carry them on, especially in the Mahratta territory, although in appearance they generally look all gentleness, simplicity, timidity, and innocence.

to their own followers. The natives in the exercise of this power, were always very desirous of hearing the criminal confess his guilt of the crime laid to his charge. To the judge it commonly mattered little, under what circumstances the unfortunate man uttered the words "guilty," whether the confession was voluntary, or whether extorted from him; but his admission of guilt seemed to operate as a salve to the conscience of his judge, and sentence was unhesitatingly passed upon him. It is also a subject of complaint, that persons of desperate and bad character are set at liberty, after having undergone punishment, (probably of hard labour,) without having previously exacted security from them for their future good behaviour. Their object in requiring security here, is chiefly with the view of checking the spirit of revenge in which they are known to indulge. This mode of proceeding would, I believe, be in conformity with the principles of our laws, and being consonant with the ideas of the native community, it seems worthy of more attention; the committing magistrate might always announce it to persons sentenced to imprisonment. Again, they say, that owing to the nature of the evidence required by our Adaulut or courts of justice, it is next to an impossibility to convict a robber of crime. They are told, that it is necessary to seize the man in the act, or with the stolen property in his possession; but how seldom this can be effected. They are anxious that collateral proof should be more attended to, and add, that if they have recourse to violent measures in protecting their property, or in securing the plunderers, they are liable to unmerited censure. They also complain much of being frequently and unnecessarily summoned to attend the Adaulut from their families and homes, as witnesses, and that they are detained for a long time on such occasions, and that the expense and inconvenience they are put to is often ruinous.

The charges against persons accused of felonious acts, should be well investigated before they are handed up before the session judge for trial, as the trial of any of these desperate characters, if not convicted, is attended with bad consequences, exclusive of the reasons before alluded to about witnesses being summoned from a distance. I am sure it would prove highly beneficial to the public interests, were a public prosecutor employed, or some one deputed from the magistrate's office to attend the Adaulut during criminal trials.

It may be stated that Government has, for some years past, shown a most anxious wish to attend to all measures connected with the Police, with the view of rendering it as efficient as possible. As it is by the hard labour of the cultivators and lower orders, that the Government exchequer is chiefly filled, it is but just, that every effort should be made to render their little property secure from robbers and plunderers. These men state, that it is with the utmost difficulty, and such as entails much distress both mental and bodily on themselves, that they can pay the demands of the Sirkar, for that gold and silver has gradually been disappearing from among them for some years past;\* the consequence is, that in the small villages at a distance from our cantonments, and not near any large commercial towns, they experience the greatest difficulty in realizing the money for which they may have sold the produce of their fields, for the purpose of paying their dues to Government. During the period of the native Government, large bodies of irregular horse and foot were dispersed over the country; this tended much to circu-

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\* It is well known to them, that much of the valuable currency of India has been abstracted within these twenty years past from circulation, to be remitted to Europe by commercial men, as well as some of those retiring from the Company's service, who have accumulated private property.

late considerable sums of money in the most distant villages, which ensured to the cultivators a much readier market than at present, and enabled them to pay their rents with greater facility.

Shortly after the country came into our possession, a few horsemen and Sibundies were stationed in the small villages in the hills three and six miles distant from each other ; this checked the proceedings of plunderers, while they assisted in rendering the condition of the poor villagers easier, by disbursing their pay amongst them. But unfortunately for all parties, the call for economizing, or some pressing necessity, has caused these small parties to be withdrawn, under the impression that the country was perfectly quiet, and would continue so ; in fact, that it was quite useless to keep them in places where their services were not required. This has too frequently proved to be a fallacy, for when the parties of horse and foot, whose presence only was the means of preserving tranquillity, were withdrawn, outrages were perpetrated : and the robbers by degrees became more audacious in their conduct, until the Police of the district required in time to be increased ; and frequently the services of detachments of the regular Infantry were required to restore order. A number of persons who had held hereditary and other appointments in the Police of the hilly districts, under the old Government, used to avail themselves of such opportunities to press their claims on the notice of the Government. As connected with this subject in a slight degree, I may observe, that the system of discipline established in the native army in the British pay, has rendered the men so efficient, that a small party of men now perform duties, which large bodies of irregular troops under the native Princes were required to execute. This has thrown a large portion of the inhabitants out of employ, it may be said, for in the existing state of the country there is

scarcely any employment for the redundant part of the population, principally composed of the discharged military : these, and many other discontented persons, have been reduced to extreme distress, and driven often to plunder to support themselves.

Although it was partly with the view of reducing the heavy expenditure of Government, and partly for the purpose of bringing the army into a higher state of discipline and military order, that the various corps and detachments stationed in different parts of the country were withdrawn, and assembled in large cantonments far distant from each other, yet there is reason to suppose, that the true interests of the state, in some respects, have by no means benefited by the change. By withdrawing all the troops that were detached over the country, the certain circulation of considerable sums of money was discontinued in those particular places, while the evil disposed were overawed by their presence, and no measures could be devised to remedy the consequence.

The continued system of drill and strict discipline has in a great measure become habitual to the sepoys, yet chiefly owing to the unceasing and severe duties they have to discharge, especially since their numbers have lately been reduced, many of them consider the life of a sepoy a very irksome one. On ordinary detached duty, or on field service, the officers have then opportunities of seeing the native officers and sepoys at all times ; and from the freedom of intercourse that takes place between them, each party becomes familiarly acquainted with the other. This good understanding produces the best feelings ; the sepoy finds that his little wants and wishes are more readily attended to and complied with (obtaining slight pecuniary aid occasionally from his officers, or leave of absence from parade if any of his family are unwell, or obtaining em-



ployment for a brother or relative, either in the public service or in that of an individual, &c). Again, an officer possessing the requisite knowledge and confidence of his men, is more capable of performing his duty, however, arduous it may be ; while by his conduct he ensures the fidelity of the sepoy to the British government.

It is well known, that while there are few men more acutely alive to a sense of severe and harsh usage than the sepoy, at the same time, there are few more sensible of kind and indulgent treatment. Their faith and attachment is great, and they show an anxiety to anticipate the wishes of such officers as are popular with them, and there is no difficult or dangerous service which they would not cheerfully perform under their guidance ; but for the present I must resume my subject ; therefore when a Bund is formed, or in other words, a body of insurgents, composed chiefly of the predatory tribes, and headed by some notorious leader, who becomes on the occasion a nucleus for the evil disposed to rally round ; and they appear in open rebellion by setting the local Police of the district at defiance, either for the sake of realizing money, or for the purpose of forcing Government to comply with certain claims which they may have thought proper to put forth, and they commence plundering in all directions, both policy and humanity demand, that immediate and most decided measures should be adopted to seize and disperse them. To effect this, a sufficient number of troops under experienced officers ought to be employed at once, to insure success to their operations. By the rapidity of such arrangements, the discontented at a distance are overawed, and prevented joining the insurgents. Every encouragement should be held out to the inhabitants, to communicate freely to the troops such information as they may be in search of ; at the same time, they ought to be urged to co-operate with the various detachments, or to act independently

by themselves. For this reason, permission should be granted to reward in the most liberal manner, those who performed any service of importance, whether sepoys or villagers; for the chances are, that the greatest efforts on the part of the troops will prove unavailing, unless they secure the cordial assistance of some of the most active and intelligent of the inhabitants, who are well acquainted with the characters of the most notorious persons amongst the population, and those who are likely to support the gang with food, money, or advice, when they are hard pressed by the troops, and will be able to point out the persons who are in the habit of receiving charge of plundered property, and disposing of it. When the gang has been harassed and compelled to disperse—continuing to follow up the same steps, will insure the capture of the majority of those who composed it.

It is evident, that unless the most prompt steps are taken to crush such proceedings at the commencement, it is to be feared that before the offenders can be brought to justice, much misery and distress will be caused to the inhabitants by the Bund; and that many of these in the small villages, will unavoidably experience much vexation from the sepoys and persons employed in the intelligence department, notwithstanding all the precautions that may be adopted to prevent such irregularities. The probability is, that in consequence of unnecessary delay, it will cost much harassing labour, much time and money, ere peace and order are re-established. It is presumed that active operations on such occasions, with a timely example of just and severe punishment, would be extending mercy to many a misguided man, who might be induced to join the insurgents from seeing the Police of the district remain unsupported. With the view of rendering some efficient local aid to the Police of districts, I some years ago (with some other proposals) suggested the advantage of employing the Desmooks of

towns and small districts for the purpose. These men continue to enjoy all the rights and perquisites to which they formerly were entitled, but owing to the influence they possessed, and having become deeply involved in the system of corruption and embezzlement, their services have been dispensed with in the fiscal department; however, I am disposed to think, that their influence might prove extremely useful, either in supporting the Patell's\* authority when he needed such aid, or in communicating to the Government district agents, information respecting any outrages which may have been committed, or which may apparently be in contemplation; for Desmooks being in general persons of considerable intelligence, have the means of gaining information, respecting the conduct and habits of the inhabitants of the various villages with which they are connected. It would be necessary to grant these men but very limited authority, for there is the greatest risk of authority intrusted to natives being abused, unless they are aware that their proceedings are closely watched by an independent and vigilant superior authority.

The very irregular and singular manner in which the boundary line of the various pergunnahs (districts) of a collectorship are defined, is very objectionable and inconvenient on account of revenue, as well as police duties; it only requires to inspect the map of any of the

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\* Unfortunately the Patellship is not such an enviable office as it used to be; the Koolkurnies supported by the Mamludars and Shaikdars have, in many instances, contrived to deprive the Patells of a great share of their influence and authority, particularly in the small villages, and as their responsibility in many respects remains the same, and they do not experience the same consideration, it renders them rather discontented. The interests of the Ryuts are much safer in the hands of the Patells than in those of the Koolkurny. The former will occasionally impose on them, but in general his feelings and interests are too closely linked with theirs, to injure them; he is one of themselves, while the Brahmun Koolkurny is quite distinct, and possesses less sympathy of feeling with them.

collectorates in the Dekhan to be satisfied of this. I know many deep and large ravines, hilly and jungly parts of districts, well known as being celebrated lurking places for robbers, which are distant from eighteen to twenty-five and thirty miles from the Thanna of the district within the boundaries of which they are situated, while the same places are not above six to twelve miles distant from another or nearer Thanna. . These circumstances may appear of little importance to many persons, but they are inconveniences which should be remedied to render the Police efficient; they greatly interrupt a zealous officer in discharging his duties, while to the robbers they too frequently afford opportunities of evading the Police. In the letter before alluded to, some observations were made respecting the necessity of employing a greater portion of the predatory tribes as local police of districts, whilst it was suggested, that they should be posted in small parties where their services might be required; and that the Naiks should not possess any great extent of authority, but that they should be liberally paid, and kept independent of each other, and only to be controlled by the Mamlutdars, whose duty it would be to watch their conduct closely, to prevent them exacting improper dues from travellers, or entering into a compromise with robbers.

The duties of many of the Naiks, Bheels, and Kolies, (and formerly of the Ramoossies,) from the arrangements which it has latterly been found necessary to make, in reducing the number of Mamlutdars (native collectors of revenue) extends at present over tracts of country including at times a portion of several pergunnahs, so that they are liable to be called upon, by two or probably three Mamlutdars at the same time. This is of course objectionable for very obvious reasons, it enables the Naiks to show too great a spirit of independence, which must prove detrimental to the public interests, should

the country be of a naturally strong description. The pay of these people upon the occasion of a robbery taking place, was liable to be stopped for an unlimited period of three, six, or twelve months, or till the stolen property was recovered. As the men employed under these Naiks were in general adventurers, and persons in very distressed circumstances, when deprived of their pay, it is well known that many of them were driven at times to commit the crimes which it was their duty to prevent. A different mode of payment was proposed, by making a small deduction from their pay monthly, and coming to a settlement by discharging the arrears once in every six months, according to the ancient usage of the country. From the balance thus to be retained in hand, deductions were made to meet the losses sustained by gross neglect of duty on the part of the Police; much villany continues to be practised by many of these Naiks and their followers, but should it at any future period be considered advisable to limit the extent of their duties, I would by no means lessen their pay, to defray the expense of establishing any number of additional Naiks. This is too common a practice under our Government in almost all departments, and it seldom proves economical. It renders the persons whose pay is reduced, discontented, and makes them exert their wits to make up the loss from some other often unlawful source. As these Naiks receive some perquisites, (ballotah, &c.) which of course they forfeit all claim to, in certain villages, when they act as guardians no longer to these places—it would be most advisable and just, to increase their pay rather than diminish it, notwithstanding their duties have decreased. Although it is necessary to lessen the expenditure, still it is necessary to be particular in the inquiries set on foot, to ascertain in what particular department, and from whose pay the deductions are to be made. The character of the persons, the situ-

ations they hold, the influence they possess, as well as the nature of the country in which they reside, should be taken into consideration. All the natives are fond of show, rank, and titles. The Naiks of the predatory classes who were employed in the police of districts under the former Government, had certain perquisites presented to them at particular periods by the inhabitants, as before explained, and which are continued in many instances, and ought to be allowed to die a natural death. This added to their dignity, and it was a consequence highly prized. It was only a few years ago, that an active and most useful police officer who was prohibited levying the accustomed perquisites of his office, was driven into rebellion. He was a man of considerable influence from his character, and had established his name as a most notorious plunderer many years before that period. He considered that his dignity, as well as his pocket, had suffered from the order that had been issued, and after fruitless endeavours to obtain an increase to his pay, he with one or two friends soon appeared among his native mountains at the head of a body of nearly four hundred men; and had not the most active steps been taken to apprehend him, he would have been immediately joined by hundreds of discontented persons, many of whom were in our pay, but on curtailed allowances.

In hilly districts where the predatory tribes form the chief part of the population, and are the cultivators of the soil, it would seem good policy to reduce the assessment; many of these are notoriously bad characters, while others of them are hard working and industrious; yet living in the greatest misery, chiefly owing to the influence of 'Koolkurnies,' 'Bunneahs,' and 'Sahookars' (agents,) who too frequently, with the connivance of the Government agents, have regulated nearly all their dealings in the most arbitrary and oppressive

manner, the consequence of which is, that they are overwhelmed with debts. From the complex manner in which the accounts of the most usurious interest and principal with other items,\* are mixed up, they become completely ruined, and often obliged to fly from their houses to escape these troublesome creditors, or to raise the money by any means.

The peace and tranquillity of a district depends much on the character of the Mamlutdar, (the native collector and magistrate) that presides over it ; many of the men employed as Mamlutdars are persons of talent and well acquainted with all matters connected with the collection of the revenue, consequently it might be supposed highly qualified for discharging the duties of the fiscal department, but most unfortunately they are with very

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\* Many a Koonby has to apply to a Bunneah (Waany) or merchant for a sufficient quantity of grain to sow his fields, as few of them are in such circumstances as to admit of their preserving any good seed grain from their own stock of the preceding season. It is very usual for the Bunneah to demand from 50 to 100 per cent. remuneration at harvest time, or a certain portion of clarified butter (ghee,) if the Koonby keeps a herd of buffaloes. When grain is cheap and there is no prospect of its rising in price, the Bunneah keeps quiet, but when there is a demand for both, and it is certain that the farmer has a supply of neither on hand, he is called on to discharge the debt, or he must submit to have it converted into money at the highest bazar rate, and it is then placed to his debit. The mode of collecting the revenue, and the high rate of assessment, forces the farmers to have extensive dealings with these Bunneahs. In the account explained to the Koonby of his affairs, there is a statement of accumulated arrears (termed balances) due for a series of years, and which very probably had been partly or wholly cancelled by order of Government ; then his share of cash taken up as a loan, or of that in the name of the village community, and disbursed in paying the various public and private demands against him ; afterwards follows the Tukkavie account, (money advanced by Government during periods of distress,) for which some of the farmers are unjustly charged interest, and it is well known that the Koolkurnies avail themselves of such opportunities to settle their own private accounts with the Koonbies. In fact it would require a person of no ordinary intelligence to comprehend their dealings, and to detect the rogueries of the Koolkurnies and money dealers.

few exceptions, extremely deceitful, being inconceivably corrupt and dishonest. And in many instances, they have a mildness of manner and there is such a want of these bold, active, and enterprising qualifications, necessary for a superintendent of police to possess, that they are not always calculated for holding the appointment, in parts of the country where the predatory tribes are both numerous and troublesome.

In selecting a Mamlutdar for an unsettled tract of country, his character and capability for regulating the police duties, should be most particularly attended to. It is of course necessary that he should not only prevent persons in the employ of Government, but all others, from conniving at irregularities, or in any manner benefiting by one portion of the people plundering the other; for oppressive acts are very apt to drive persons of unsettled habits from their homes, and too frequently force them to subsist by robbery.

One of the most judicious measures lately adopted by the Bombay government, and one which promises to afford great protection to the interests of the inhabitants as well as to those of the state, is that of permanently stationing the collector's assistants in the districts, in charge of two or three pergunnahs or talooks of each collectorate. These gentlemen have the power of effecting much practical good, by establishing a free and confidential intercourse with the people, which can only be done successfully by divesting themselves of the trammels of office, and watching vigilantly the conduct of clever and influential persons of their own departments; (for there is scarcely a native who has been employed for any length of time under the same European officer, and secured such gentleman's favourable opinion, and entire confidence, that will not avail himself of his situation to commit the meanest and most oppressive acts, his avarice urging him to seek every opportunity of advancing his own pecunia-



ry interests and those of his relations). These gentlemen will then have opportunities of checking such acts of interference and injustice as before alluded to, and preventing in a great measure the system of embezzlement and speculation which exists to such a very great extent in the fiscal department all over the country, and to the extinction of which very pernicious system, many of the collectors have for years directed their most able and zealous exertions.

This arrangement will also affect the local Police of districts ; it will tend greatly to render it much more active and efficient, for all parties will see the necessity of being more circumspect in their conduct, from their proceedings being more closely watched by their superiors.

There can be little doubt, that if matters could be so arranged as to preclude the necessity of removing collectors and their assistants so frequently from one appointment to another, as exists at present, it would afford very general satisfaction, for the ryuts say that it often happens a collector or his assistant is removed from among them, just as they have succeeded in becoming acquainted with him. Although they have the utmost confidence in the justice and integrity of the European character, they dread communicating freely with the gentleman placed over them on a subject of importance, unless they are personally acquainted with him, or he is famed for being of easy access, and being kind to those who approach him. A Koonby might wish to communicate some nefarious transaction, but he holds back, being uncertain whether the subject of his representation would be enquired into, and that he might afterwards be left at the mercy of some native in authority, who would contrive to be revenged on him, for they have numerous opportunities of doing so.

Some observations respecting the description of troops supposed to be best adopted for being employed in the pursuit of the different predatory tribes, when they form Bunds (gangs) of insurgents, are offered here with all due deference.

A very large portion of the Bombay army consists of Hindoostan men. It must be admitted that these men termed Purdessies (foreigners), more especially the Rajpoots, from their size and figure, with their independent and military gait, have a most imposing appearance. Among the numerous Purdessies that enlist in the Bombay regiments, although we find a few Kanoujiah Brahmuns, still many of them are of inferior and some of the most degraded classes, persons who may be considered mere adventurers, respecting whose character, name, or village, nothing is known. Many of the Purdessies are frequently found extremely turbulent and discontented, and particularly overbearing in their behaviour to their superior non-commissioned and commissioned officers, should the latter be natives of the Konkan or Dekhan, more especially when on detached duty without a European officer. It therefore seems desirable that the Hindoostan men should have native officers of their own caste with them on such occasions, although there are instances of native officers of the Purwarry caste, retaining them in high order.

The Purdessy sepoy is in general a well formed man, good looking, active, intelligent, very cheerful and high spirited, and well dressed when off duty; as water is one of the greatest luxuries in India, the Purdessy is in great distress if there happens to be a scarcity of this necessary of life where he is stationed. In physical force he is superior, but he has more prejudices than the natives of the Dekhan and Konkan, and will not so readily submit to privations and hardships as the Bom-

bay sepoy, therefore he is not so well calculated as the more hardy, active and patient man of this presidency to be engaged in operations against the predatory tribes, when these take refuge in their hills and jungles. The Purdessy is more liable to sickness, when traversing the wilds into which his duty leads him on these occasions, and it is a very great disadvantage to him, that he is unacquainted with the Mharatta language, at least, seldom understands it sufficiently well, to enable him to communicate freely with the inhabitants, for in such irregular warfare, the services of intelligent individuals, and those of conciliating manners, are often put in requisition ; yet I have seen some of the Purdessies, extremely active and zealous, while engaged in the most harassing and disheartening of duties. It is worthy of notice that the offspring (frequently in the first instance illegitimate) of the Hindoostan Rajpoots, who have settled in the Dekhan, are generally a very superior race of men, very active and intelligent, possessing considerable energy of character, and a high degree of ancestral pride.

Allusion has already been made to the large proportion of the population within the Bombay territory that remain unemployed, and who are consequently involved in much distress ; and as it is desirable to ameliorate their condition as much as possible, it may be observed, that no measure would tend more effectually to accomplish this, than by restricting the recruiting for the army to the limits of this establishment: By adopting such an arrangement, greater tranquillity might be insured to the country, and at the same time no additional expense would be entailed on Government ; indeed, it might prove highly advantageous in a financial point of view, by retaining and circulating more money in the interior of the country, than is at present to be found there. For several years past, large remittances in gold have been annually made to Hindoostan, and when we

know that there were upwards of twelve thousand Purdessies lately in the Bombay army, it may be truly said, that the inhabitants of the Konkan, and the Dekhan, have not for some length of time been treated with that degree of consideration and regard, that their claims and merits demanded. It ought not to be forgotten, that it was those parts of the country that furnished the active, hardy, and faithful sepoy<sup>s</sup> that first established, and have maintained the high character, and distinguished reputation of the native army of this Presidency.

Although it may be considered advisable to employ a few Purdessies in the different regiments, with the view of increasing the number of mixed castes in each corps, still from five to eight men a company, would be quite sufficient for all purposes. A much larger or unlimited number, might be sanctioned for the service of the Cavalry if deemed necessary, but both justice and policy require that a more liberal and ample provision should be made for such men of our own provinces as feel disposed to seek employment by entering the ranks of our army. The firm footing we have established in India, is mainly to be ascribed to the admirable management, and arrangements, connected with the constitution of our native army. The wise and judicious system of recruiting, invaliding, and pensioning, with all the attendant comforts, has hitherto insured the devoted attachment of the men ; but our situation in many respects is much altered ; the spirit of rivalry and enmity that existed for such a length of time among the natives, and which led to our being often brought forward as the mediators in their quarrels, is nearly extinct. Our open enemies are now comparatively few, while our secret foes have increased in number. We have become the supreme rulers of a most extensive empire, and the advantages and rewards we confer on the natives of the country,

should consequently be on principles of the most liberal, just, and benevolent policy. A very great improvement has lately taken place, respecting the employment of natives in the civil branch of the administration, by employing them more extensively in responsible situations, and on higher salaries. It is generally admitted that an improvement is much required in the mode of remunerating a few of the old and meritorious native officers of the army. With the British government it is a characteristic feature, to make a marked distinction between the pay of civil and military classes, but setting aside the justice of the claims of these men, to be remunerated in a proportionate degree with their civil brethren, policy points out the absolute necessity of it. I shall conclude these remarks by adding that great care should be taken that no measures are adopted, or any orders issued, calculated in any manner to affect the prejudices of the sepoys, or make them suppose for a moment, that any alterations in the least degree disadvantageous to them, of a pecuniary nature, were in contemplation. Let us avoid doing that which might shake the unbounded confidence they have reposed in our honour, our faith, and our generosity.

The observations embraced in this concluding chapter, may be considered of too general and irrelevant a nature, and therefore uncalled for ; but in touching on such matters, my object is twofold, the hope of private, as well as the public interests being benefited however slightly, by my having done so ; for every suggestion that leads to the adoption of measures that contribute to alleviate distress among a poor people, will naturally tend to check and prevent irregularities and acts of violence ; and where there is security of property, and peace reigns, there will be little need for the services of a hired and expensive Police establishment. The people are well aware, that the watchful and fostering solici-

tude of the British local government is such, that many oppressive acts of the natives in subordinate authority placed over them, only require to be fairly represented to insure a speedy remedy.

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## A P P E N D I X.

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IN the account of the Poorundur Ramoossies it ought to have been mentioned, that the Ramoossies of the small village of Korralla, on the north bank of the Neera river, and east of Jejoory, possess some land in that village on the Meerassy tenure ; this they obtained as being the descendants of one of the Patells of the place, in whose family, at one period, a female of the Ramoossy tribe resided.

The Ramoossies of Jejoory are Khomneys, and the Patells of that town bear the same surname. It is said that the Ramoossies claim rights and dues in consequence, which the Patells do not acknowledge. I am aware that an unfriendly feeling exists between the parties, for the Patells declined going security for the Ramoossies, when I called on them on one occasion to do so. The Patells usually go security for the watchmen, unless they are persons of notoriously bad character.

The Ramoossies of Roherry, near Bhore, enjoy fifty begahs of enam land near Ootroolly, (the village at which Oomiah was seized). This ground was bestowed on them as a reward for services rendered by them many years ago to the desmook of Amboorah. One of the members of the junior branch of this family, having quarrelled with the representative of the elder branch, the latter was assassinated, and the younger branch usurped the rights of the elder: but the widow of the deceased being far advanced in a state of pregnancy,

effected her escape and secretly took refuge in the house of the Ramoossy Naik ; every possible attention and comfort having been rendered to her, she was in the course of a short time safely delivered of a boy : when he attained the age of maturity, he was, with the assistance of the Ramoossy Naik, reinstated in his rights.

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### TRANSLATION

*Of a Copy of what was said to be inscribed on the Copperplates belonging to the Kolies of the Fort of Poorundur.*

“ FREEHOLD grants to Essoo Naik, son of Kristnajee Naik Choocha, and Hybut Naik the son of Venket Naik, and Duttoojee Naik the son of Ramjee Naik, and Bhyrjee Naik the son of Sone Naik, from the King of Bedur, in the Arab year 587 ; on a copperplate it is written, that in the fort of Poorundur at the Sendry Bastion, they had been going on with the building, but that it was unfinished at this time : the King saw in a vision, that if the eldest son and his wife were given (viz. to be buried in the foundation) the work would prosper—such was the King’s dream. The Prince awoke, and getting up, sent for Essoojee Naik Choocha, and explained to him the nature of his dream ; upon which Essoojee Naik said, that he would (try to) effect the desired object, and although difficult, that he would accomplish it. Having stated this much, he sent for Bhyre Naik, and related all the particulars (of the dream) ; hearing which, Bhyre Naik answered, ‘ I will give my eldest son Nath Naik and my daughter-in-law’ (for this purpose). When he said this, Essoojee Naik represented to the King that he (Bhyre Naik) was willing to give his son and daughter-in-law ; all was arranged on the 8th of the dark half of asswin ; on the right hand side of the Sendry Bastion, Nath Naik and Deowukaie (his wife) were

both buried (alive), after which the works of the bastion were finished ; and the King came from Bedur to Poorundur to see the fort, and having inspected the Sendry bastion, His Majesty expressed much satisfaction. He granted the fort of Poorundur entirely to Essoojee Naik, and Bhyrjee Naik, the King gave from the fort of Poorundur (205) two hundred and five hoons (money of the time a hoon worth about four rupees) and from the two villages of Nhave and Bhonggoly (705) seven hundred and five hoons, after which the King returned to Bedur, Essoojee Naik accompanied His Majesty. After this Essoojee Naik and Venkut Naik were both detached against Abdul Shaw; having punished the enemy and obtained victory, they returned to Bedur. The monarch being extremely pleased, he granted to them at Poorundur, money, the Sir Naiky and Enam land (freehold) in different villages as follows :—

The Sir Naiky of Rajgur for Rupees 5,000

The Sir Naiky of Torna fort for 4,800

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Total Rupees, 9,800

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Land in the following 17 villages :—

| In Sewry,  | 7½ Chours | In Belsur,    | 2 Chours |
|------------|-----------|---------------|----------|
| Kherebary, | 10 do.    | Sassoor,      | 5 do.    |
| Peemply,   | 1 do.     | Koldury,      | 2 do.    |
| Chambly,   | 4½ do.    | Pandy,        | 4½ do.   |
| Keekvy,    | 1 do.     | Singhur hill, | 2 do.    |
| Mhour,     | 1½ do.    | Mandur,       | 1½ do.   |
| Pareenchy, | 3½ do.    | Wagoly,       | 3 do.    |
| Narrain,   | 1½ do.    | Khudud,       | 1½ do.   |
| Soopah,    | 2 do.     |               |          |

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Total, 50½ Chours.

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(equal to 6,030 Begahs) and the (9,800) nine thousand eight hundred rupees were granted in freehold, and a deed bestowed about a year afterwards. The King went on a hunting excursion. On this occasion Essoojee



Naik Choocha killed a royal tiger, which he placed before the King ; His Majesty being greatly pleased, directed the Naik to ask what present he wanted. Having respectfully saluted the King, after a short silence, he represented, that the fort of Poorundur and the Sir Naiky, and freehold lands of different villages and Nhavy, and Bhonggoly, both these villages, and money, were formerly bestowed ; ‘ and all I ask for now, is that ‘the grant above alluded to, should be written out on a copperplate ; that the tribe of Kolies may alone continue entitled to it, and that no other may interfere with it, according to this representation a copperplate should be prepared.’ The King being well pleased, called both Dummul Punt and Beerbul, and gave them to understand that he had previously given up the fort of Poorundur and all its stores, &c. to Essoojee Naik Choocha ; they were therefore to deliver over all to him, and Beerbul got all the old Deeds from Essoojee Naik, and from these prepared that written on the copperplate—therefore you and your offspring are to enjoy this grant from generation to generation, and he who shall deprive you of the same must be born of a hog.”

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II.—*A brief notice of some of the Persian poets.*—By  
*Ensign NEWBOLD, 23d Regiment M. N. I.*


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*Awhad Uddin Khàwari.*

• اوحداالدين خاوري

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Awhad Uddin Khàwari, was a native of Khàwar, and cotemporary with Sàrjar, a Sultan of the Seljúkian dynasty, whose exploits he celebrated. Sàrjar is said to have flourished in the sixth century of the Hejira. From some lines, of this poet's composition, in the *Turikh i Guzidah*, it appears that he was acquainted with the sciences of natural philosophy, logic, music, astronomy and astrology.

Towards the close of his life he retired from the Sultan's Court, and from the world altogether ; and although repeatedly solicited by Sanjar to return, steadily persisted in passing the remainder of his days in the quiet of retirement ; saying that, " he had selected the patched robe (the *khirkah*) of the Súfis, in preference to a thousand garments of satin ; and that the cup of patience, filled with the prayers of contentment, was, in his eyes, a goblet overflowing with wine."

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*Afzal Uddin Azraki.*

افضل الدين ازرقى

This poet was cotemporary with Sultan Ibrahím Ghaznaví, and was born at Herat, a town of Khorassan in the fifth century of the Hejira. He was patronized by Thógrul Shah ; and many anecdotes are related, proving the favor in which he was held by this monarch. He was the author of the poem entitled the *Alfiyeh Salfiyeh* الفیه سلفیه a work abounding in warm and amorous descriptions, the perusal of which restored his patron to his former vigour and health. Herbelot thus notices Azrakí ; " Surnom d'un Auteur qui est qualifié

Hakim et Schaer, Philosophe et Poète. Il a composé un poème intitulé, *Alfiâh u Maschg aliah*, pour le Sultan, Thogrul le Selgincide, qui était devenu impuissant avec les femmes, ou il a mêlé plusieurs histoires lascives, et beaucoup des figures impudiques." One day when Thogrul Shah was amusing himself at *Nerd*, نرد a sort of game played with dice, three ace came up instead of three sice; this annoyed the Sultan, on which Azraki uttered the following impromptu :—

رباعی  
 گر شاه سه شش خواست سه یک نقش افتاد  
 تاظن نبیری که کعبتین داد نداد  
 شش چون نگریست چشمت حضرت شاه  
 از هیبت شاه روی برخاک نهاد

*Quatrain.*

"Although your majesty desired three sice, three ace have turned up,  
 Do not however imagine that the dice have done you injustice;  
 Oh King when sice caught a glance of your eye,  
 From very fear of your majesty it prostrated its face on the dust."

*Adib Sâbir*

ادیب صابر

Adib Sâbir flourished in the reign of Sultan Sanjar Seljûki by whom he was dispatched on an embassy to the ruler of Khorâssan, Altezîz. He was treacherously drowned by order of this chief, one night, in the river Jyhûn (the Oxus). The author of the *Tarikh i Guzidah* does not give any information regarding the compositions of this poet, contenting himself simply by citing a few lines from one of them, by no means remarkable for their beauty.

*Assir Uddin Admâni.*

اثيرالدين ادمانی

This poet derives his distinguishing appellation from

Admān a place in Hāmādan. He was the encomiast of Sultan Suliman Shah, *Hākīm* of Kúrdiston; he died in the time of Hulāko Khan, who flourished in the seventh year of the Hejira. His death was occasioned by a satire, he composed on Mujid Uddin Tawil, the aged Càzi of Hāmādan, of which the following is a stanza :—

رباعی  
نه از آن داشت فذا مرگ و ی اندر تاخیر  
که بریداجـ لش می نه نه اید تعجیل  
لیک در تیه ضلالت نه چنان گم گشته است  
بصد سال برد راه بسـرشـ عز را ییل

“ It was not on account of this, death spared him so long,  
That he was exempt from the common lot of mortals;  
But so deeply sunk was he in the abyss of vice,  
That it was a hundred years before the angel of death could  
reach him.”

So nettled was the Càzi at this pungent satire, that he recited the *Súrat al ikhlás* forty times standing, uttering imprecations on the unfortunate poet; who, our Persian author gravely asserts, languished and died from its effects. The *Súrat al ikhlás* سورة الاخلاص is the last chapter but two of the Koran much venerated by Mahometans and declared in the *Hadis* to be equivalent in efficacy to one third of the whole Koran. It contains the declaration of the unity and essence of God. And, when recited as above, under certain conditions, is supposed to act as a most powerful spell.

Regarding this chapter we find in the *Miscchat ul Masábih*, that, “ Abu Dardar reported that his Highness said, ‘ Is not one of you able to repeat a third part of the Koran in one night?’ The companion said, ‘ How can any one repeat a third in one night? for it is not without difficulty.’ Mohammed said, ‘ The chapter

commencing with these words, ‘ say, God is one God,’ is equal to a third part of the Koran in rewards.”

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*Assir Uddin Akhsanji.*

اثيرالدين اخسنجي

Akhsanji was an inhabitant of the town of Farghanah in Transoxania, and was much esteemed as a poet; though it does not appear that any of his compositions, beyond a few lines quoted by the author of the *Tazkirat Us Shoara*, are extant.

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*Abullah Mahomed Bin Abubekr Osman Imami.*

عبدالله، محمد بن ابوبكر عثمان امامي

This poet was the panegyrist of the Sultan and Vazier of Kerman; his works are esteemed. He resided at Herat and died in the time of Abaka Khan, son of Hulako Khan, in the seventh century of the Hejira.

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*Anseri.*

عنصری

Anseri flourished in the reign of Mahmud Ghaznavi, during part of the 4th and 5th centuries of the Hejira.

When Firdousi came from Toos into Persia, Anseri together with Furrokhí and Asjadí, two celebrated poets were seated on the bank of a river and seeing Firdousi approach, in a mean garb, agreed among themselves to recite the three first lines of a stanza, a line each; the fourth and last was to be demanded from Firdousi in order to put his talent as a poet to the test, and moreover in case of his failure to rid themselves of his company.

Anseri was the first to address his future master in the art, which he did in the following uncourteous manner; “ Friend, it is not customary for any but poets to associate with poets.” Firdousi modestly replied,

"I too know a little of poetry." Anseri then rose from his seat and recited the first line of the stanza agreed on

چون عارض تو ماو نباشد درو شـ

"The moon is not so brilliant as the cheeks of thee (my mistress").

Asjadi continued—

ماند درخت گل نامود در گلشن

"Nor can the rose of the parterre vie with thee in bloom."

Furrokhi then said—

زگازت گذرمی کند از جوشن

"Thine eyelashes pierce through a cuirass;"

The trio of poets, exulting in their fancied triumph, and imagining that the Persian language did not contain any word to rhyme with the three just repeated, demanded from Firdousi the line wanting. Firdousi without the slightest hesitation completed the stanza, and put an end to their premature victory, by the following line, which both rhymed with, and preserved the sense of those of his three rivals:—

ماند سنان گدیور جنگ با پشـ

"Like the arrows of Guî in the combat with Poshan."

The rudeness and contempt of the three poets were now converted into delight and admiration; particularly after Firdousi had recited to them several parts of his celebrated epic the Shah Nàmeh; the commencement of which, versified from the ancient Chronicles of the Persian empire, from the time of the Kaioomers down to the end of the Sossanian dynasty, he was then conveying to the Court of Sultan Mahmùd Sabuktaghîn who however had previously entrusted this great undertaking to Anseri, who had been chosen from among seven competitors.

The following anecdote of Anseri is related by Doulet Shah. "When Sultan Mahmùd defeated and took prisoner Abu Ali; Sejestâni, a poet of considerable

celebrity and formerly preceptor to Anseri, fell into his hands, and was about to be put to death, as a punishment for some lampoon he had written against the Sultan; when Anseri who was in great favor with the monarch generously interceded and saved his life: and moreover shared with him a magnificent present bestowed on him by the Sultan. Anseri's disinterested and warm patronage of his great rival Firdousi reflects the highest credit on him.

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*Abu al Fereh Runi Ustád.*

ابوالفرح رونی استاد

This poet is also known under the title of پسر آتش son of fire, he was cotemporary with Sultan Malek Shah Seljuki and was a native of Khorassan, he died A. H. 482.

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*Anwarí.*

انوری

Hukim Anwarí was a native of Abiùrd in Khoràssan, and studied poetry under Abu al Fereh Rùni, who, on account of his celebrity as a teacher, obtained the title of *Ustád*. Anwarí however soon surpassed his preceptor.

Herbelot relates the following anecdote of Anwarí:—  
“During the time he was pursuing his studies at the Mansùriah college in the city of 'Toos, Sultan Sanjar passed by with a numerous retinue. Anwarí was seated at the door, and on seeing a person well mounted and equipped, whose appearance particularly struck him, he enquired who he was. On finding him to be one of the Sultan's poets, he felt convinced that poetry must be held in high estimation at the Court of this prince, in order to enable a poet to maintain such a costly appearance; and that it might prove advantageous to himself to apply to the culture of so profitable an art. This idea made so lively an impression on his mind, as to

induce him to compose a poem in praise of Sanjar the same night ; which he presented to that prince, the following day.

The Sultan, who was no bad judge of the merits of poetical compositions, deemed the production excellent ; and perceiving it to be the offspring of an extraordinary genius, asked Anwarî whether he would prefer being attached to the Court, or, simply, a pecuniary gratification. He immediately answered, in verse, that he had no other ambition than that of being in the service of so great a prince.

The Sultan, from that time, retained Anwarî near his person and transferred him from the college to the Court."

The Tears of Khorassan, a poetical address to Sanjar, is among the best of his productions.

He excelled in odes and *médahs* ; his style is elegant and chaste and greatly admired by Persian Savans. It is said also that he was a proficient in astronomy.

*Awhad Uddin.*

اوحدالدين

Was a native of the province of Kermân, and hence sometimes styled Kermâni. He was accounted a good poet. The following is a stanza to the mole on his mistress's forehead, the pupil of her eye, and the amber coloured mole on her cheek :—

رباعی .

دلبر من رقم مشک بزمه بر زده بود

خلق را آتش سوزنده بدل بر زده بود

• زهر امون، کدیده باخون تر میگرد

عذیرین خال که در برک گل تر زده بود

" The ravisher of my heart inscribed a musky character on the moon

Whilst consuming fire preyed on the hearts of mankind ;



The pupil of her eye keeps her eyelashes continually moist with the blood (of those pierced by her glances).

An amber-coloured mole was imprinted on the fresh rose-leaf (of her cheek)."

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*Assedî.*

اسدي

This poet was a native of Toos in Khorassan, and had the honor of being Firdousi's teacher. He is called Toosi from his native country and flourished in the reign of Sultan Mahmûd Ghaznavî.

It is said that, when importuned to versify the Shah-Nâmeh, he excused himself from this arduous and laborious undertaking, under the plea of weakness and advanced age.

Assedî composed a poem containing an argumentative dispute between Day and Night, in which he makes the latter come off victorious.

His death took place A. H. 409, and his remains were interred in the burial ground of Tabriz.'

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*Ahmed Kermanî.*

احمد كرماني

Ahmed was the author of an epic poem, celebrating the exploits of Timûr-lang (Tamerlane). He translated the *Mercât al loghat* مَرَقَاتُ اللُّغَاتِ an Arabic dictionary, also translated into Turkish, into Persian verse.

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*Ahli Khorassânî.*

اهل خراساني

This poet flourished towards the middle of the tenth century of the Hejira. His compositions are in high estimation. Among them are the *Sahr i helâl* سحر دلال; the *Shems wa Perwaneh* شمس و پروانه; the *Kitáb i lassáyed* کتاب غزلیات and the *Kiláb i Ghazliyat* کتاب غزلیات.

III.—*Some account of the P'hansigars, or Gang-robbers, and of the Shúdgars, or Tribe of Jugglers, by JAMES ARTHUR ROBERT STEVENSON, Esq. of the Madras Civil Service.—(Communicated by the Bombay Branch Royal Asiatic Society.)*

*Read 1st of February, 1834.*

*(Extracted from the Journal of the Royal Asiatic Society, Vol. 1. page 280.)*

The *P'hansigars*\* are a tribe of, perhaps, the most deliberate and decided villains that stain the face of the earth. I hardly know whether they should be called a tribe, for they have no distinct religion or prejudices: they admit into their fraternity persons of all castes and persuasions; and the gangs which are found in different parts of the country appear to have no general knowledge of, or connexion with, each other, further than the diabolical compact existing among a few of the members who may at any period have acted in concert in their trade of villany. The following few particulars I gathered from the examination of part of a large gang which inhabited a village on the western frontier of the NIZAMS country, not very far from Bijapur.

The number of males in this troop amounted to about sixty, almost all of whom had families and houses in Dudgi, which they considered as their head-quarters. They were subject to two *náiks*, or chiefs, who planned their expeditions, and regulated the division of booty, being themselves entitled to a double share: they were also responsible to the *pattél*, or head of the village, for the payment of a regular tribute, the price of his protection and silence. The greatest proportion of this gang were Muhammedans; but there were among them Rajaputs, and other castes. Their ostensible employment was agriculture and daily labour; but their only actual means of subsistence was the plunder obtained by the

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\* From the Hindustani word *Phánsí*, a noose.

murder of their fellow-creatures. When their means of debauchery and indulgence became limited by the expenditure and waste of their ill-gotten wealth, fresh expeditions were ordered, and parties sent to make circuits in different directions, all the plunder being brought to their head-quarters to be shared. They were sworn to a fair division, to secrecy, and to inviolable fidelity to each other. Their standing rules were never to rob without first depriving their victim of life, never to attack by open force, and never to leave the smallest traces of their crimes; the bodies of the murdered being entirely defaced or deeply buried, and the property sent to a distant market. As all their murders are perpetrated by means of strangulation, no marks of blood are left on the spot; and so well have they generally kept their resolves and contrived their crimes, and so faithful have they generally proved to each other, that there are but few instances of *P'hansigars* being convicted in a court of justice, although they have been repeatedly apprehended. A departure from their rules (the commission of a daring robbery which was quite out of their line) led to the seizure of the gang to which I have alluded.

Their methods of proceeding in their own horrid trade are various; but the chief object in view is to lull their victim into a sense of security before they proceed to deprive him of life, which is, as before remarked, always effected by strangulation. When a favourable opportunity presents itself, one of the party throws a noose, which is made with a tightly twisted handkerchief,\* round the destined sufferer's neck; an accomplice immediately strikes the person on the inside of his knees, so as to knock him off his legs, and thus throw the whole

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\* This cloth, or handkerchief, is stated to be always of a white or a yellow colour, those being the favourite colours of their tutelary deity MARIATTA, the goddess of small-pox in Malabar.

weight of his body on the noose ; and a very few seconds puts an end to the unfortunate man's struggles. The plan generally adopted by the *P'hansigars* is to pretend to travellers, or to Company's sipahis proceeding to their homes on leave of absence, to have met them by chance, and to agree to pursue their journey together. They likewise fall into conversation with travellers whom they may meet on the road, or in the choultries and halting-places, and frequently share their provisions with them, proposing, at last, that, as they are all travelling the same road, they should, for the sake of companionship and mutual security, travel together. The first favourable opportunity that offers itself on the road is seized to murder the deluded traveller ; but so cautious and wary is the *P'hansigár*, that he will often accompany his victim several days' march before he can find a place and an opportunity sufficiently safe for his purpose.

Another mode of luring the traveller to his destruction is by the assistance of a woman. They select a pretty-looking girl of their tribe, and place her near some retired road, where she watches until she observes an object of prey fit for her purpose. She has a pitiful story ready to explain the cause of her having been left thus alone in the jungles, and seldom fails to interest the unfortunate listener, who almost always falls into the snare that is laid for him. The girl sometimes excites his passions, and, having seduced him into a favourable spot, herself fastens the fatal noose, her companions being always near enough to afford timely aid. The traveller, if mounted, will perhaps offer to take the girl up on his horse, to assist her in overtaking the party she says she has lost ; but before he has advanced many paces, the murderess casts the snare round his neck, and, throwing herself from the horse, drags her

protector to the ground, where he is speedily despatched by the ever ready accomplices.\*

One of the *P'hansigars* to whom I have alluded in the commencement of this paper turned king's evidence, and was very particular in his details. He said, that during their last tour of a fortnight they had murdered sixteen individuals; and he also mentioned a circumstance which will tend to shew the barbarity with which they carry on their terrible system. The party of *P'hansigars* had retired to rest in a pagoda, in which a *Laskart*† had also taken up his quarters for the night, during the course of which he was murdered. The assassins dug a hole in the *sanctum* of the pagoda, in which to bury the corpse, but they found that it was too small to admit the body; they consequently dismembered it, and then succeeded in thrusting the mangled pieces into the hole.

The booty for which these horrid murders are committed is often so trifling—sometimes not exceeding one rupee, or the clothes on the person's body—that it appears as if the *P'hansigars* found a delight and a pastime in such deeds of blood. This seems more probable, as I found from their cant phrases (of which I collected a few examples, since lost), that they had ludicrous names for the convulsive struggles of their expiring victims, as well as for murder, the noose, and the different acts attending their diabolical trade. An old woman, one of the tribe, repeated them to me with a great deal of glee. She, as well as most of the other females, made no secret of their vocation, and appeared to think that there was nothing wrong in it. When

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\* Females, and persons of some particular castes and occupations, are considered by the *P'hansigars* as exempted from their attacks, being, as they imagine, in some way connected with their goddess.

† A camp servant, whose general business is to attend to the pitching of tents, &c.

asked of what cast they were? they answered *P'hansigárs*. How do you get your livelihood? By *p'hansigáring*. Are you not ashamed of your way of life? have you never followed any other trade? No, this is the same trade that our fathers followed; if we don't *p'hansigár*, how are we to live?

I fear that many gangs of these miscreants still exist; they have been for the most part, hunted out of the British territory, but they are said to carry on an uninterrupted career in the *Nizáms* country, and in other independent provinces. The forms of law have allowed many to escape, or have obliged the magistrates to let loose on their fellow-creatures beings who are a disgrace to the lowest order of the human race—in fact, they are a race of vampires undeserving of the name of man.\*

The *Shúdgárshid* is a tribe of jugglers and fortune-tellers, who wander about the Dekkan, and, probably, other parts of the country, where, however, they are not known by this name, but generally, I believe, by that of *Gáródi* (juggler), which is the denomination of the caste in the *Vijnāneswára Sástra*. The *Karnataka* term of *Shúdgárshid* is derived from *Shúdgár* (a burning or burial-ground) and *shid* (proficient, ready) it being their habit to prowl about these places to collect certain pieces of human bone, with which they are supposed to work charms and incantations. The tribe is looked upon with much awe and detestation, and the fear of exciting the wrath of any of its members, generally secures a ready compliance with their demands for charity. On this, however, they do not place their only reliance,

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\* In the *Asiatic Researches*, vol. xiii. p. 250, will be found an ample and detailed account of the *P'hansigárs*, *Thegs*, *Búdheks*, &c. all different classes of gang robbers in India, furnished by Dr. Sherwood, Mr. J. Shakespear, &c. The former gentleman gives several specimens of the cant phrases of the *P'hansigárs*; a sort of language termed by them *Pheraseri-kib-dí*, "the language of despatch."

they are notorious for kidnapping children, and also for an abominable traffic, consisting in the sale of sinews extracted from the breasts, the wrists, and the ankles of females ; these are supposed to be preservative charms from all evil : but, in order that they may possess this virtue to the full extent, they must be taken from the person of a woman who has been very lately delivered. An instance of this practice occurred at *Shólápúr* a few years ago ;—a rich merchant named DEVELAT had a married daughter (LAKSHMI) who resided in his house, and who had been confined of her first child about ten days, when she was suddenly missed. The infant was found in its cradle, but no search was successful in discovering the unfortunate mother. It was at last remembered by some member of the family, that on the morning of the day on which the girl was missed a female *Shúlgārshid* had been at the house, and had told the fortunes of several of the inmates. Knowing the habits of these people, apprehensions and anxiety regarding the fate of the lost LAKSHMI were excited to their height, as it was deemed beyond doubt that she had been enticed away, and had fallen a victim to the *Shúlgārshid*, who was immediately seized ; but nothing could be learnt from her, for she denied ever having seen the girl. In the course, however, of the inquiries and cross-questioning of the friends,—probably not conducted in the mildest manner—some words dropped from the juggler regarding a neighbouring tank. This induced the parties to proceed there and to examine its waters, in which the body of the unfortunate girl was quickly found ; the sinews from the breast, ankles, and wrists, had been extracted, but no further marks of violence were visible. The event was now made known to the civil authorities, but the *Shúlgārshid* continued firm in her denial of all knowledge of the affair, nor was any other information regarding the fate of the unhappy

LAKSHMI ever obtained. The caste of *Shûdgârshid* is said to have sprung from the union of a woman of the *Pàtrâwat* (stone-cutter) tribe, and of a *Kûlu* or *Kabîr* (boat-man). *Kabîr Rishi*, the author or compiler of one of the *Vedas*, taught the art of magic to some of the first of this race, who have now lost the greater part of their original skill. The deity which they conceive chiefly entitled to their worship is the goddess CHOWDI; whose principal shrine is in Malabar, where, I understand, the caste is most numerous. North of the *Krishna* they worship KAMAKSHIKA, a goddess whose chief pagoda is in Kandahâr.

The descendants of a *Mahâ purushâ* named MALSIDAYA, a *Jangam* of *Parvati Malkârgin* on the *Krishna*, are still looked upon by the *Shûdgârshids* as their *gûrûs*. It is related that two *Shids* LING SHID and MUSEM SHID used to sit in the burial-grounds at Delhi up to their necks in the earth; and that at night, by the power of their incantations, they caused the dead to rise and to wander as evil spirits through the city. The *Mahâ purushâ*, MALSIDAYA, famed for the strict observance of all his religious and moral duties, and for the severity of his penances, visited Delhi, and by the divine aid accorded to him in reward of his piety, counteracted the deeds of the *Shûdgârshids*, and finally cast out the evil spirits. The *Shids* fell at his feet, acknowledged his superior power, and bound themselves and their posterity to consider and to obey him and his descendants as their *gûrûs*. Up to this day, the *Shûdgârshids* are said, once a year, to visit the descendants of MALSIDAYA at their *Matts* in *Parvati Malkârgin*, to make their offerings to the *Jangams*, and to receive from them the small bags in which they carry their charms. There is also in *Miritch*, in the southern Mahratta country, a shrine much visited by the *Shûdgârshids*. It is the tomb of a Muhammedan saint called SHEINNA MIR VAIGAMBAR,



who, tradition says, was endowed with supernatural powers to enable him to overcome a washerman named GANGA DHOBI, who was deeply skilled in the art of magic, and exerted it to oppress and torment the *Shûd-gârshids* and all the minor professors of the art.

(Signed)

J. A. R. STEVENSON.

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IV.—*Biographical Sketch of the Literary Career of the late Colonel COLIN MACKENZIE, Surveyor-General of India; comprising some particulars of his Collection of Manuscripts, Plans, Coins, Drawings, Sculptures, &c. illustrative of the Antiquities, History, Geography, Laws, Institutions, and Manners, of the Ancient Hindûs; contained in a letter addressed by him to the Right Hon. Sir ALEXANDER JOHNSTON, V.P.R.A.S. &c. &c.*

(*Extracted from the Journal of the Royal Asiatic Society, Vol. 1. page 333.*)

[The Catalogue of the Mackenzie Collection published at Calcutta by professor WILSON, in the year 1828, being with difficulty procurable in England, it has been thought that the following account of that Collection might not be unacceptable to those persons who feel an interest in the subjects which it was intended to illustrate, and who may not be aware of its nature and extent.

This sketch was communicated by Colonel MACKENZIE himself in the year 1817, to Sir ALEXANDER JOHNSTON, whom he had known from his earliest youth, with a view to its publication in the event of Col. MACKENZIE'S decease before any accurate and complete catalogue of the Collection should be prepared; and it is the document alluded to by Sir ALEXANDER, in the evidence given by him before the Committee of the House of Commons, in the year 1832; on which occasion he proposed that the government should take the necessary

measures for authenticating and completing the collection, in all its different departments of science and literature.

As this subject was also referred to at the anniversary meeting of the Royal Asiatic Society, held in May last,\* it may be proper to state, that the Council transmitted an application, through the Right Hon. the President of the Society, to the Hon. Court of Directors of the East India Company, soliciting it to avail itself of the ready means now in its power, of laying open and bringing into use the whole of this valuable collection.]

MY DEAR SIR ALEXANDER,

1. No one can have a fairer claim than yourself to expect some account, however concise, of the nature of those inquiries in which, you are aware, my curiosity, if not my attachment to useful research, has induced me to embark, for a great part of the term of a residence in India which has now extended to several years. The chief predisposing causes of a course so foreign to the general habits of military men, and so little prepared for by early instruction, it were unnecessary to enlarge upon on the present occasion; I must, however, attribute some part of them to the early seeds of passion for discovery and acquisition of knowledge, and to ideas first implanted in my native isle; to these I may add a further stimulus, in the contemplation of the opportunities too often neglected or passed over in doubt, for want of a conviction of the utility of those efforts, that, if steadily directed, could, in many instances, acquire and preserve a body of information, available for those more regular processes of investigation which may be conducted on more permanent principles.

2. That in the midst of camps and the bustle of war, and of travel and voyages, the human mind may be

\* See Journal of the Royal Asiatic Society, No. I. p. 165.

exercised to advantage has been long known and acknowledged ; and although all “ that a CÆSAR wrote, or a CAMOENS sung,” may not be reached by every military adventurer, it is nevertheless universally admitted, what a celebrated sage of antiquity writes, “ *that the human mind can expand to the occasion.*” † That science may derive assistance, and knowledge be diffused, in the leisure moments of camps and voyages, is no new discovery ; but, in complying with your wish, I am also desirous of proving that, in the vacant moments of an Indian sojourn and campaign in particular (for what is the life of an Indian adventurer but one continued campaign on a more extensive scale), such collected observations may be found useful, at least in directing the observation of those more highly gifted to matters of utility, if not to record facts of importance to philosophy and science.

3. The first thirteen years of my life in India, from 1783 to 1796, may be fairly considered as of little moment with regard to the objects pursued latterly, as collecting observations and notices of Hindú manners, of geography, and history ; for, with every attachment to this pursuit, to which my attention was turned before I left England, and though not devoid of opportunities, yet the circumscribed means of a subaltern officer, my limited knowledge of men in power or office, and the necessity of prompt attention to military and professional duties, did not admit of that undeviating attention which is so necessary at all times to the success of any pursuit ; much more so to what must be extracted from the various languages, dialects, and characters, of the peninsula of India.

4. A knowledge of the native languages in particular, which is so essentially requisite, could never be assidu-

† This sentiment is in TACITUS, I think (from recollection), in a speech of TIBERIUS.

ously cultivated, in consequence of the frequent changes and removals from province to province, from garrison to camp, and from one desultory duty to another. Official encouragements to study the languages of the vast countries that have come under our domination since my arrival in India, were reserved for more happy times, and for those who are more fortunate in having leisure for the purpose. From the evils of famine, penury, and war, the land was then slowly emerging; and it struggled long under the miseries of bad management, before the immediate administration of the south came under the benign influence of the British government.

5. On the whole of this period, in which I have marched or wandered over most of the provinces south of the *Kistna*, I look back with regret; for objects are now known to exist that could have been then examined; and also traits of customs and of institutions that could have been explained, had time or means admitted of the inquiry.

6. It was only after my return from the expedition to Ceylon in 1796, that accident, rather than design (though ever searching for lights that were denied to my situation), threw in my way those means that I have since unceasingly employed, not, I hope, without some success, of penetrating beyond the surface of the antiquities, the history, and the institutions, of the south of India.

7. The connexion I then formed with one person, a native and a Bráhmaṇ,\* was the first step of my intro-

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\* The lamented KAVELLI VENKATA BORIA, a Bráhmaṇ, then almost a youth, of the quickest genius and disposition, possessing that conciliatory turn of mind that soon reconciled all sects and all tribes to the course of inquiry followed with these surveys. After seven years' service he was suddenly taken off from these labours, but not before he had formed his younger brothers and several other useful persons of all castes, Bráhmaṇs, Jannas, and Malabars, to the investigations that have since been so satisfactorily pursued.

duction into the portal of Indian knowledge. Devoid of any knowledge of the language myself, I owe to the happy genius of this individual the encouragement to pursue, and the means of obtaining, what I had so long sought ; for which purpose an acquaintance with no less than fifteen different dialects, and twenty-one characters, was necessary. On the reduction of Seringapatam, in 1799, not one of our people could translate from the Kanarese alone ; at present we have translations made not only from the modern characters, but the more obscure and almost obsolete characters of the *Sassanams* (or inscriptions) in Kanarese and in Tamil ; besides what have been done from the Sanscrit, of which, in my first years in India, I could scarcely obtain any information : but from the moment the talents of the lamented BORIA were applied, a new avenue to Hindû knowledge was opened ; and though I was deprived of him at an early age, his example and instructions were so happily followed up by his brethren and disciples, that an establishment was gradually formed, through which the whole of our provinces might be gradually analysed by the method thus fortuitously begun and successfully followed so far. Of the claims of these individuals, and the superior merits of some, a special representation has been made to this government.

8. For these thirteen years, therefore, there is little to shew beyond the journals and notes of an officer employed in all the campaigns of the time : first, towards the close of the war of 1783, in the provinces of Koimbatore and of Dindigul ; afterwards on professional duties in the provinces of Madras, Nellore, and Guntore ; throughout the whole of the war, from 1790 to 1792, in Mysore, and in the countries ceded to the NIZAM by the peace of 1792 ; and from that period engaged in the first attempt to methodise and embody the geography of the Dekkan, attempts that were unfortunately thwart-

ed or impeded by measures which it is unnecessary here to detail: the voyage and campaign in Ceylon may be noticed as introductory to part of what followed on my return to resume the examination of the geography of Dekkan.

9. Some voluntary efforts for these purposes had at last excited the notice of a few friends in the field, in the campaigns in Mysore, too partial, perhaps, to my slender talents, and my ardour for the pursuit; and in 1792, after the peace of Seringapatam, I was sent from the army in Mysore, by the desire of the late revered Lord CORNWALLIS, with the small detachment at first employed in the NIZAM's dominions, for the purpose of acquiring some information of the geography of these countries, and of the relative boundaries of the several states then assuming a new form and new limits.

10. It would be tedious to relate the difficulties, the accidents, and the discouragements that impeded the progress of this design from 1792 to 1799,—the slender means allotted, from the necessity of a rigid (no doubt, a just) economy; the doubts and the hinderances ever attendant on new attempts; difficulties arising from the nature of the climate, of the country, and of the government—from conflicting interests, and passions, and prejudices, both difficult to contend with and unpleasant to recollect.

11. In the year 1796, a general map of the NIZAM's dominions was submitted to government for the first time, compiled and digested from different materials of various authorities, described in a memoir that accompanied it, and designed rather as a specimen for future correction, and to shew what was wanting, than to prove what was done. It had, however, the use of bringing the subject into one point of view; further inquiry in 1798 and 1799 improved its supplements, and some encouragement was then held forth that induced persever-

ance in the design, though but little effectual assistance was given ; and my removal from any share in the direction of the Dekkan surveys in 1806, put a stop to the further prosecution of this map. It has not, however, been neglected, and it is hoped it may yet be resumed by the revisal of the materials since collected, though on a more circumscribed scale than was once intended.

12. On my return to Haiderábad in 1798, for the *third time*, to resume the investigations of *Dekkan geography*, measures were proposed, and in part methodised, for describing the whole of that territory ; and before 1799 considerable assistance was obtained from a copy of the regular official *daftar* of the Dekkan, in its provincial and even more minute divisions. This has been since translated from the Persian, as well as certain MSS. of authority, which were proposed as the basis of the plan to be followed in the inquiry and description. The Dekkan was in fact then a *terra incognita*, of which no authentic account existed, excepting in some uncertain notices and mutilated sketches of the marches of BUSSY, and in the travels of TAVERNIER and THEVENOT, which by no means possess that philosophical accuracy demanded in modern times.\*

13. This plan was nearly overset at the commencement by the new war with TÍRU, in the year 1799 ; it may be satisfactory, however, to know, that the attempts then made were not without their use both in a military light (as described more fully in official reports,) and in anticipating measures that have since been, or may still be, advantageously followed in arranging the history, antiquities, and statistics of that interesting country.

14. After the reduction of Mysore in 1799, and in the arrangements that followed, I was employed in fur-

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\* See GENTILE's Opinion on the Geography of India. *Voyages aux Indes.*

nishing the commissioners with geographical information, to assist in the arrangement of the limits of the subject of partition. On my return to Madras, the governor-general (the Earl of MORNINGTON) being justly of opinion that a more complete knowledge of these countries was indispensably necessary for the information of government, was pleased, in the most handsome manner, without solicitation or any personal knowledge to appoint me to survey Mysore, with an establishment suited rather to an economical scale of expenditure than to so extensive an undertaking, intended to be carried through a country so little known, that the position of some of the provinces ceded by the treaty of partition could not be ascertained\* till this survey was carried forward, and that under peculiar circumstances of embarrassment.

15. In conformity with my original ideas, I considered this opportunity favourable for arranging a scheme of survey embracing the statistics and history of the country, as well as its geography; and therefore submitted a plan for this purpose, which was approved of by the government. Three† assistants and a naturalist were then for the first time attached to me; yet this moderate establishment was immediately afterwards disapproved of in England, and a design that originated in the most enlightened principles was nearly crushed by the rigorous application of orders too hastily issued, which were received in India in the end of 1801, when I had, at very considerable hazard of my health, just completed the survey of the northern and eastern frontier of Mysore.

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\* For instance, Hollollkaira, ceded to the Mahiattas; Gúdikatta, on the N.W. of Chittledrúg, mistaken for a small part north of Kolar, in the east of Mysore; and many other instances, whence some knowledge of the country rendered a survey indispensable.

† Mr. MATHER, Lieutenant WARREN, and Lieutenant ARTHUR, assistant surveyors; and Dr. HAYNE, surgeon and naturalist.



16. How far the idea suggested was fulfilled, it is not for me to say; from adverse circumstances, one part was nearly defeated, and the natural history was never analysed in the manner I proposed and expected in concert with the survey. The suspense I was placed in from the reduction of the slender stipend allotted to myself, both for my salary and to provide for increasing contingencies, was in itself sufficiently mortifying; and the overthrow of the establishment first arranged for the work, while other\* branches were favoured in the application of the orders of the court, the effects of these measures on the public mind, and even of my assistants, all contributed to deaden and to paralyse every effort for its completion. Notwithstanding these difficulties, however, the success attending the early researches, and a conviction of its utility, induced me to persevere till 1807; the geography of the provinces of Mysore was actually completed to the minutest degree of 40,000 square miles of territory, considerable materials were acquired for the illustration of its statistics and its history, and the basis laid for obtaining those of the peninsula at large, on a plan which has been undeviatingly followed ever since (see the opinion of the Court of Directors on the completion of the work, letter B. annexed).

17. Much of the materials collected on this occasion were transmitted home in seven folio volumes, with general and provincial maps; but it is proper to observe, that still more considerable materials for the history of the south are in reserve, not literally belonging to the Mysore survey, though springing from it. Notices of some of these are in the accompanying sheets.

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\* In the regulations of survey of 9th October, 1810, no less than twenty military officers were attached to the quarter-master-general, exclusive of the military institution and the establishment of native surveyors under the revenue department. The results arising from those departments, compared with that of the Mysore survey, would afford the most just means of judging of the utility of either of the works.

18. It is also proper to observe, that in the course of these investigations, and notwithstanding the embarrassments in the way of this work, the first lights were thrown on the *history of the country below the Ghâts*, which have been since enlarged by other materials constantly increasing and confirming the information acquired in the *upper country*. Among various interesting subjects may be mentioned, .

1. The discovery of the *Jaina* religion and philosophy, and its distinction from that of BUDD'HIA.
2. The different ancient sects of religion in this country, and their subdivisions—the *Lingaran-ta*, the *Saivam* and *Pandaram Matts*, &c. &c.
3. The nature and use of the *Sassanams*, and inscriptions on stone and copper, and their utility in throwing light on the important subject of Hindu tenures; confirmed by upwards of 3000 authentic inscriptions collected since 1800, hitherto always overlooked.
4. The design and nature of the monumental stones and trophies found in various parts of the country from Cape Comerin to Delhi, called *Virakal* and *Maastikal*, which illustrate the ancient customs of the early inhabitants, and, perhaps, of the early western nations.
5. The sepulchral tumuli, mounds, and barrows of the early tribes, similar to those found throughout the continent of Asia and of Europe, illustrated by drawings, and various other notices of antiquities and institutions.

19. On the conclusion of the field duties of the Mysore survey, the compilations resulting from it have since at different times occupied much attention. An office was conferred on me in Mysore, which was afterwards confirmed by the Court of Directors, for the purpose of following up the investigations, and digesting and im-

proving the materials in some tranquillity ; but on a reform of some branches of the military establishment in 1810, that department was entirely new-modelled, and my appointment ceased, without any compensation, in salary or otherwise, for what I then lost. The Honourable Court in that order had signified their approbation of what had been done, and even sent out other orders encouraging the further pursuit of my inquiries, which have been hitherto but partially attended to, and, from the present aspect of things at this presidency, do not appear likely to be soon fulfilled, either to my satisfaction, or according to the intentions of the Court.

20. At the end of 1810, the government of Madras, on a view of the sudden increase of the expense of surveys in the preceding five years, and the unconnected and confused manner in which these works were executed, without being founded on any general or fixed system, found it necessary to create the office of surveyor-general, similar to one already established at the other presidencies, and was pleased to appoint me (without any previous communication) to this charge, for reasons the propriety of which I had in vain attempted to shew for fourteen years previously. In consequence of the little countenance given to these propositions in Europe,\* I had, on the completion of the Mysore survey, relinquished all idea of conducting what would have been gratifying to early habits, and more appropriate to the state of my health and my time of life some years before ; and I only undertook the charge at this time in hopes of being useful in assisting to give shape and order to what I had long considered important to the public, and beneficial in an economical point of view to the East India Company.

21. I was employed in arranging this office, for car-

\* And of the measures adopted at Madras in 1806, that I considered adverse and contradictory to the hopes held out to me for years back.

rying on these duties in future, and for combining the execution and results of the several works on one general systematic plan, together with measures for preserving and digesting the various materials resulting from the labours of several years, in connexion with a very considerable reduction\* of expense; when, from the exigencies of the military service, my professional attendance on the expedition to Java was required by the concurring authorities of government; and I had only time to deposit the materials then collected in the office, and to propose a plan for its administration during my absence, when my attention was necessarily called to the duties of the expedition. Of that service on which I embarked, with all alacrity, in obedience to the wishes and orders of my superiors, several detailed reports were submitted to government in India, to which my friends need have no scruple in referring.

22. It may not be improper here to observe, that the plan proposed for the surveyor-general's department in 1810, besides a very considerable reduction of the expense previously incurred for different unconnected, and, I may add, inefficient establishments of survey, embraced (at the same time with a gradual extension on one regular system of the usual objects of geographical delineation) the formation of a body of statistical and historical materials, in addition to the mass of geographical and military surveys then collected and deposited by me in one office, for the first time, before my departure. Among these is a copy of the memoirs of the statistical and geographical survey of the Mysore country, with the original sections, charts, and maps constructed from them, on various scales from one to twenty-four miles,

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\* In the very first year, ending 1st December 1810, the annual expense was reduced from 85,000 or rather 100,000 pagodas per annum, to 55,000 pagodas, by the operation of the plan submitted, and this with more effect than in the former unconnected system—as appears from a table of five years' expense, presented to government on 30th April 1816.

which were among the first of the official documents delivered into the office of the surveyor-general, under the inspection of a special committee, early in 1811.

23. Of the Mysore survey, the detailed reports stand on the records of Government at Fort St. George, and copies were sent home to England. For the opinions of the authorities at home on the close of that work, the annexed extract is referred to (Letter B). On its final completion in March 1809, the remaining establishment of native surveyors was sent, on my special representation, to the ceded districts, the examination of which has been since effected; thereby almost completing\* an entire survey of all the dominions of the late sovereignty of Mysore, as it existed a few years ago in the plenitude of its power and territory. This work adds 30,000 square miles to the 40,000 formerly reported on (mentioned in B), altogether 70,000 square miles, minutely analysed. The direction of this survey of the ceded districts was voluntarily conducted without any specific compensation, until it fell into the general superintendence of the surveyor-general's office, which is now again reversed and transferred to the surveyor-general of India.

24. While these works were in progress, the collection of materials on the history, antiquities, and statistics of the country, was going on throughout the whole of the provinces, under the presidency of Fort St. George, on the basis of the information originally obtained on the Mysore survey, by natives trained and instructed by me for this purpose, and with the only charge to government of the postage being franked, and the aid of some of the native writers: but all the purchases have been entirely at my private expense, as well as the collection of MSS. throughout the Karnatik Malabar, the

\* The survey of Dindigul recently finished, and materials of which are about to be sent home, completes it, that of Baranah being done several years ago.

southern provinces, the Cirkars, and the Dekkan. The papers annexed explain the progress of this branch during the period of my absence in Java: I regret that I cannot at present recur to other documents more fully explanatory of the extent and nature of these researches into the ancient history and present state of the south of India, as the greatest part of the collection has been sent on to Calcutta to wait my arrival at that presidency.

25, A detailed view of the origin and progress of that branch alone (the historical investigations) would more properly be the subject of a separate memoir: a concise view of a similar attempt made in Java is annexed (in No. A). This was effected under limitations of time and means required by local circumstances; but under a liberal degree of encouragement and protection, both from the local government there, and from two successive governors-general of British India, which heightens the contrast in other cases, and without any expense to government on that account, the success of these investigations justifies the hope, that considerable advantage may be derived from following up the same plan of research wherever the influence of the British government affords the same facilities, in the intervals of military occupation.

26. On my return to this presidency in 1815, I found the office of surveyor-general at Madras was ordered to be abolished, and before I could well go into the revisal and completion of the review of the survey department commenced in 1811, and which had been discontinued in consequence of my being sent on foreign service, I was honoured with the appointment of the office of surveyor-general of India, on a new system which required my residence at Calcutta or Fort William. My attention has in consequence been chiefly turned to that object ever since, with the view of fulfilling the Honourable Court's intentions in conferring an appointment

which I must ever consider an honourable mark of distinction, justly demanding efforts that I had no longer in contemplation.

27. I will only further notice the effect of this removal on the inquiries and collection here described. The people trained by me for several years being natives of the coast or the southern provinces, and almost as great strangers to Bengal and Hindustan as Europeans, their removal to Calcutta is either impracticable, or where a few, from personal and long attachment (as my head *Brahman*, Jaina translator, and others), are willing to give this last proof of their fidelity, yet still it is attended with considerable expense; and without that assistance, most of what I had proposed to condense and translate from the originals in the languages of this country, could not be conveniently, if at all, effected at Calcutta.

28. I mean, however, to attempt it, and hope in this last stage, preparatory to my return to Europe, to draw up a succinct view of the whole collection, and prepare a *catalogue raisonné* of the native manuscripts, books, &c., and also to give the translated materials such form as may facilitate the production of some parts, should they ever appear to the public, at least by persons better qualified, if the grateful task be not permitted to my years, or to my state of health.

I regret exceedingly that the pressure of business at this moment will not permit of my adding further to this hasty sketch; but it would require an actual inspection and reference to the originals themselves, to give you any tolerable idea of their nature, and of the interest my partiality may attach to them. I hope, however, that it will appear to all considerate men that some leisure for tranquil and exclusive application to their arrangement would be at least necessary to one who has now resided thirty-four years in this climate, without

the benefit of once going to Europe, or even to any other presidency, on account of health or private business.

I remain, my dearest Alexander,

• &c. &c. &c.

(Signed) COLIN MACKENZIE.

*Mudras, February 1, 1817.*

The Collection of Notes, Observations, Journals, and Collections of MSS., Inscriptions, Drawings, &c. made by Colonel MACKENZIE, in India, may be arranged under the following heads:—

1. *Journals, Notes, Observations, and Memoirs, for thirty-four years, kept at intervals on successive Journeys and Campaigns, through all the provinces now subject to Fort St. George (excepting Malabar and the Cirkars north of the Kistna), from 1783 to 1790.*

These remarks were afterwards extended through the whole of Lord CORNWALLIS's campaigns in Mysore, from 1790 to 1792, with particular journals of all the operations, elucidated by maps, plans, and drawings of the battles, sieges, &c. Of the several journeys into the newly ceded districts of the Nizam, Kuldapa, Kanoul, the wild mountains of Yermulla and Nulmulla, &c. bounding the Karnatik as far as the *Kistna* at Purwat-tum, till 1794; also four different journeys into the Dekkan, as often relinquished for other expeditions; the campaign of the Nizam against the Mahrattas in 1795; the battle of Kurdla; the expedition to Ceylon; reduction of Kolumbo, and return; a journey to Haiderabad; thence to Kulburga, with description and drawings of that ancient capital of the Dekkan; return to Madras; preparation and materials collected for the designed expedition to Manilla; return to Haiderabad, and arrangement made for a regular analysis of the Dekkan, and of the Nizam's dominions; suspended finally for the last campaign and war against Mysore; the march from



Haiderabad for that purpose; during these military movements, measures proposed and information obtained for the future investigation of the history of Bijanagar, and the ancient Kanara and Tellinga empires; journal of the campaign, siege, and capture of Seringapatam; journals through the whole of the survey of Mysore from 1800 to 1807, including observations; and various memoirs on different subjects, customs of the inhabitants, climate, soil, institutions, &c. (exclusive of the official memoirs sent to Europe), several of them particularly mentioned under their respective heads. After a residence of three years and a half at Madras, under the constant expectation of removal, then follows the expedition to Java; journals of the voyages, and campaigns, and the interesting journeys through, and a residence in that island for two years; afterwards on a journey from Calcutta by Benares to Lucknow, Agra, and Delhi, to the mountains dividing Thibet, whence the Jumna and Ganges issue into Hindustan; back from Hurdwar on the Ganges through Rohilkund, and again to the Ganges; on this journey of nine months the same method was observed of preserving notes, memoranda, memoirs, and journals; and the collection of ancient coins, MSS., inscriptions, and sculptures, considerably increased.

From the frequent and sudden changes of place that Colonel MACKENZIE'S course of service, for thirty-four years, was always subject to, these journals, &c. are not all fairly transcribed or arranged from their original notes, and, in several instances, are restricted to short cursory notices intended to be extended afterwards, accompanied by plans, views, sketches by himself, or by friends. It is supposed that if the whole were condensed, they would form six folio volumes, accompanied by authentic charts, drawings, &c. geographical, military, &c. &c.

2. *Memoirs of the Survey of Mysore, Geographical, Statistical, and Historical.*

The original copies, in seven volumes folio, were sent to England to the Court of Directors in 1808, accompanied by general maps, exhibiting the country in detail on a scale of four miles to an inch, where all its features, rivers, mountains, and every place, are laid down; lately introduced into ARROWSMITH'S general map of India, by permission of the Court of Directors. A series of provincial maps, on a scale of one mile, descriptive of the several provinces, were also compiled from the original sections of survey deposited in the office at Madras.

3. *Memoirs of the Ceded Districts.*

On the same plan with that of Mysore; including the geography, statistics, and history of these provinces, accompanied by maps from scales of one to four, twelve, and twenty-four miles to an inch. Two volumes sent to England, and more than two more still in preparation, to be transmitted to the Court of Directors.

4. *Materials for a General View of the South of the Peninsula.*

The above have been executed under the immediate direction of Colonel MACKENZIE, and the same plan is now under execution for the remaining districts under Fort St. George, so far as the measures adopted by this government may admit. The completion of the whole being designed by Colonel MACKENZIE to furnish a body of materials for a complete view, geographical, statistical, and historical, of the whole British possessions in the south of the Peninsula, accompanied by maps, under the immediate protection of the East India Company, at whose expense the surveys have been executed; but the historical and literary materials have been hitherto chiefly obtained at Colonel MACKENZIE'S private expense.

5. *Materials for a complete view of the geography, statistics, and history, ancient and modern, of Java, and*

the Dutch dependencies in the eastern islands. In the journals, memoirs, and drawings of Colonel MACKENZIE (entirely exclusive of the materials furnished by the committee of tenures, of which he was president in Java), several native MSS. have been, or are now translating, from the Javanese and Malay languages, by natives and others employed for that purpose, and considerable extracts and translations from Dutch and French books and MSS.\* Notices of some of these are subjoined (see letter A. annexed). From the matter contained in these documents much light is thrown on the early colonization of these islands, and perhaps of the long doubtful subject of the peopling of America, at least of the intercourse and communication of the Continent of Asia with the numerous islands of the Oriental and South Seas, and of the laws, institutions, manners, and customs of the more eastern parts of Asia, so widely different from those of the western Peninsula of India.

6. A great object has been, under these inquiries, derived from the latter occupation (but chiefly at Colonel MACKENZIE'S private expense, excepting the single article of postage\*), to collect and to obtain translations of materials of various descriptions illustrative of the history, antiquities, and institutions, &c. of India. This was originally directed to those of the Karnatik or Bijanagar and its dependencies exclusively, and afterwards extended, as circumstances admitted, to that of the several dynasties that were successively brought to light; to materials illustrative of the history and antiquities of Hindustàn and of all parts of India, but more particularly to that of the south or Peninsula; and, ultimately, by the sudden direction of his services in 1811, (arising from

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\* This correspondence on literary subjects has been exempted from postage in India, by order of Government, and approved of by the Court of Directors, since 1808.

the exigencies of the public service), to the Oriental islands and coasts of Asia.

7. Materials, memoirs, and historical pieces translated, illustrative of the history of the several *Muhammedan dynasties* that were successively established in the Dekkan or the south of India, from the thirteenth to the eighteenth century, under their respective heads; illustrated by descriptions, plans, and drawings of the cities, forts, buildings (civil or religious), remaining, by coins, inscriptions, &c. These include

I. The earlier Muhammedan governments in Dekkan, of

- |               |                |
|---------------|----------------|
| 1. Biejápore. | 4. Ahmednagar. |
| 2. Golkonda.  | 5. Dowlátabád. |
| 3. Beder.     |                |

II. The Mogul government in the Dekkan.

8. Materials collected and translated, illustrative of the geography and political arrangements and provincial divisions of the Dekkan, in its six *súbas* or viceroyalties, from the earliest times till the arrangement made by ASAF JAH (the celebrated Nizam-ul-Mulk), in the beginning of the eighteenth century. This is of more importance, as by this arrangement most of the political divisions of territory among the present existing powers, the Nizam, the Mahrattas, &c. are thereby regulated; and some knowledge of it is a necessary prelude to that of the present state of the south of India. This object, which has constantly been in view since Colonel MACKENZIE was sent with the Dekkan subsidiary force in 1792, by Lord CORNWALLIS, till he was removed from it in 1806, has never been lost sight of in the intervals of other professional and public engagements. The *Daftar* of the Dekkan, the *Hakikát Hindústán*, and the history of KHAFI KHAN\* (an author of credit, little

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\* The history of KHAFI KHAN includes the annals of the celebrated Aurangzib's reign, hitherto a desideratum in Indian history, excepting the first ten years.

known hitherto), with other authentic MSS., have been translated from the Persian, Mahratta, and other native languages, and now form a body of materials designed to assist a work descriptive of the geography, history, and statistics of the Dekkan, which has been in its progress communicated to several respectable authorities well qualified to estimate its design, and approved of by them.

These were also designed to be accompanied by a series of maps, charts, and drawings.

9. The history and antiquities of the *earlier dynasties*, of which notices are daily occurring, are more unconnected and obscure; yet sufficient matter appears in inscriptions, ancient buildings, sculptures, and coins, in addition to traditions, poems, &c. to furnish materials for a sketch of the early dynasties and sovereigns of these countries previous to the Christian era and era of Sallivahana, such as, viz. :

1. The kings of Banawassi\* in the N.W. whose ancient inscriptions and characters confirm the popular tradition of the country of a great kingdom having once been established there.

2. The kings whose capital was *Amrawully* on the *Kistna*, where the singular fragments and remains lately discovered exhibit specimens of beauty and taste in design and execution, seldom found in Hindú sculpture. Drawings of these were taken.

3. The ancient Kuramber kings, and the pastoral, hunting, or nomadic tribes, who occupied this country, previous to the introduction of the doctrine of the *Vedas* by the *Chola* kings, and to whom several antiquities, buildings, sculptures, establishments, and coins, of late brought into notice, are supposed to belong.

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\* The position of Banawassi is laid down in Ptolemy's Tables.

10. Drawings, maps, plans, and sketches; these are arranged as under :—

*I. Maps and Charts.*

1. Atlases. •
2. Portfolios.
3. Folio and quarto volumes.
4. Miscellaneous rolls, &c. containing
  1. Geographical, general, and provincial maps. •
  2. Political and statistical maps and plans.
  3. Mineralogical and orological maps; to which is proposed to be added,
  4. A philological map descriptive of the extent of the various languages spoken in the fifty-six *Désans* or Hindú divisions of the *Bharata Kandam*, or India.

*II. Drawings.*

1. Views and sketches of remarkable places.
2. Plans of cities, fortresses, battles, sieges, &c.
3. Ditto of ancient cities and temples, &c. as Bijanagar, Halla, Bede, and other ancient capitals.
4. Elevations and sections of ditto.
5. Collection of drawings illustrative of the state and progress of the arts of design, of sculpture, &c. &c. among the Hindus, 2 vols. large folio.
6. Ditto of ditto of various plants, trees, flowers, executed during the surveys, 4 vols. folio.
7. Ditto of ditto of the costume of the various classes of inhabitants of India, the different sects of religion, &c. &c. 3 vols. folio.

The collections (which are gradually increasing, from the constant accession of original materials of late years,) are bound and arranged in volumes chiefly folio, either provincially or according to language, &c. in the following order, viz. :

1. *Southern Provinces, containing History, Antiquities, Institutions, &c.*—Ancient Chola Mandalam, and

*Pandya-Mandalam*, or Tinnevely, Madura, Tanjore, Koimbatore, &c.

2. *Western Provinces*.—Ancient *Kérala* and *Chéra Mandalam*, or Travankore, Malabar, Kanara, Konkan, Bednore, Sùnda, &c. &c.

3. *Central Provinces*.—Upper Karnataka, Mysore, Chittledrúg, Raidrúg, Nawabship of *Seráh*, Harponelly, Pennakonda, Báramahl, &c. &c.

4. *Eastern Provinces*.—Ancient *Tonda Mandalam*, Modern Arkot Súba, Payen Ghát or lower Karnatik (erroneously), Nellore, Ongole, Palnád, &c.

5. *Ceded Districts*.—*Nanda-Mandalam*, comprehending Kanoul, Kuddapa, Kummum, &c. and extending to the Kistna.

6. *Northern Districts*.—Comprehending the *Andora*, *Mats'ya* and *Kallínga Désams*, the modern Cirkars of Guntore, Masulipatam, Kondapilly, Chikakole, &c. and the *Odia Désam*, or modern Orissa, or Ganjam, Cirkar, and Kuttack.

7. *Muhammedan History*.—Comprehending the history of the several states or sovereigns of this religion since the thirteenth century.

8. *Mahratta History*.—Comprehending materials either relating to this nation or its sovereigns, of modern origin, under SIVAJI, SAMBAJI, RAMRAJA, &c. &c. till the permanent establishment of the present or modern Mahratta state under a Peshwa.

9. *Karnatik and Bijanagar*.—Translations of original works illustrative of the history of that empire under its several dynasties of Karnatik, Tellinga, and Kurramber sovereigns, with reference to their grants, inscriptions, &c.

10. *Tellinga and Oria, or Northern Cirkars*.—Comprehending the Materials of the history of Warungole, and the several dynasties of these languages or nations :

the Kuttak Ballalls, the Rájás of Kallinga, of Rájámándri, of Bezoada, &c.

11. *Chola and Pandya*.—Comprehend the materials translated of these ancient dynasties confirmed and compared by their inscriptions still remaining, by books, poems, and various works of their ancient sages.

12. *Sassanams, or Hindú Inscriptions, Grants, Edicts, &c.*—These are of three kinds:

1. Comprehends copies of the original *sassanams* transcribed in all parts of the country, from stones generally, more rarely from copperplates: it is supposed that above 3000 at least have been collected by intelligent natives trained and formed for this purpose.

2. Fac-similes and drawings of the most ancient and curious of the above, being those that are in antique characters—some now obsolete—some read with difficulty—others entirely unknown: it was thought right to preserve fac-similes of them, to authenticate the materials.

3. Translations of the most interesting and curious of the inscriptions from the different languages; besides a great portion still untranslated on *Kajun* leaves, country paper, &c.

N.B. The materials from which the above are taken are in fifteen different languages and twenty-one different alphabetical characters; and it was necessary to employ persons conversant in each, sometimes with great difficulty, to extract them from those languages, as follows:—

| <i>Languages.</i> | <i>Characters.</i>                       |
|-------------------|--|
| 1. Sanscrit.      | 1. Obsolete.                             |
|                   | 2. Dévanágari or Baulobund.              |
|                   | 3. Grundum.                              |
| 2. Tellinga.      | 1. Ancient Tellinga, very old, obsolete. |
|                   | 2. Ditto.                                |
|                   | 3. Modern Tellinga.                      |



| <i>Languages.</i>                | <i>Characters.</i>   |
|----------------------------------|--|
| 3. Kanara.                       | 1. Ancient Kanara undeciphered, from Banawassi and from Mahabálipuram. •   |
|                                  | 2. Purwad-Halla-Kanara.  |
|                                  | 3. Halla, or Ancient Kanara.   |
|                                  | 4. Modern Kanara.  |
| 4. Mahratta.                     | 1. Mo'd'hi ;— no inscriptions on stone in this, but there are several grants on paper.   |
| 6. Modern Tamil                  | } 1. Ancient Tamil.  |
| 7. Malliallum.                   |  |
|                                  | 2. Modern Tamil.   |
|                                  | 3. Tamul of the Malabar coast.   |
| 8. Tulva.                        | 1. Tulva ;— language and character of Lower Kanara.  |
| 9. Wodia.                        | 1. Wodia ;— language and character of Wodia or Orissa, or Ganjam and Kuttack,  |
| 10. Bengáli.                     | 1. Bengáli.  |
| 11. Hindwí, Hindustáni or Moors. | No peculiar character.   |
| 12. Persian.                     | 1. The grants and edicts of the Mogul emperors and vice-roys are on paper and in Persian. These belong to the period since the 17th century. |
| 13. Arabic.                      | } 1. Arabic.   |
| 14. Malays.                      |  |
|                                  |  |
|                                  | 1. Ancient Javanese from inscriptions.   |
| 15. Javanese.                    | 2. Modern ditto.   |

N. B. There are also fac-similes of several inscriptions in characters still undeciphered, some daily arriving—such as the inscriptions at Delhi, at Allahhábad, from Java, from Ceylon,, from Mahabálipuram, from Banawassi, &c. &c.

13. *Stallamahâtams, or Stallapurânams.*—These comprehend the legends, *pûrânams*, or traditions—accounts of the several *stallams*, or holy places of Hindû worship ; as every temple has or ought to have its *pûrânânam*, those of the present establishments are evidently founded on the legends of the followers of the *Vêdas* ; the *pûrânams* of the principal *stallams* are procured as *Kanchû, Trinamala, Tripetty, Srirangam, Râmiseraam*, &c. &c. ; a few are translated, and more are proposed to be so as specimens. Two vols. translated, bound ; four ditto originals, bound, folio.

14. *Laws, Institutions, &c.*—These parts embrace the several codes of laws received among the Hindûs.

15. *Sects of Religion.*—Account of the origin, history, and opinions, of the different sects of religion among the Hindûs :—the followers of the *Vêdas* ; the Jaina, Samanâl or Srâvaks ; the Buddhists ; the Saivamattam, &c. &c. &c.

16. *miscellaneous.*

17. *Extracts from Foreign European Authors.*—Translated regarding Indian history, antiquities, literature, and geography, ancient and modern.

The collection already transmitted to Calcutta, and bound in folio volumes, upwards of forty may be classed under the following heads :

1. *History, Antiquities, and Institutions* of the empire of the Karnatic or *Karnata* (called *Narsinga* erroneously by early European writers), under its several dynasties of *Ballalls, Wodiars, Kurambers, Tellangas*, &c. princes and extracted from authentic documents from about 1600 up to about 500° A. D., and more obscurely still further to near 80, A. D. when the eras or mode of reckoning used in inscriptions in these countries were changed and are lost sight of, corroborated also by collation with European and Muhammedan authorities

2. Ditto, ditto, for the dynasties that reigned in the south with more or less extent of power and territory previous to the former, under the several names of *Chola*, *Pándya*, &c. confirmed by actually existing inscriptions and records.

3. Ditto of the more obscurely known dynasties of *Tellingu* and *Wodia* kings, of Warankole, Anakonda, Bezoada, Rajamandiri; Kuttak, &c. illustrated by inscriptions, plans, drawings, and MSS. terminating in the 14th century.

4. Ditto of the empire of *Kanara*, whose capital was at *Kalliani*, till its decline by a schism of religion, and finally by the first Muhammedan invasion of ALLA-AD-DIN, in the early part of the 14th century.

5. Ditto, ditto, of the kings of *Deogiri* or *Dévagiri* (now Doulatábád), terminating at the same time; less is known yet of this dynasty, though it is hoped considerable materials may be obtained to illustrate this chasm in Hindú history, which involves in obscurity the origin of the celebrated sculptured caves of Ellora, which, it is to be noticed, are close to the cite of the ancient capital of *Dévagiri*.

6. The history of the remains of the *Bijanagar* empire, from the fatal battle wherein RAM-RAJ fell, A. D. 1536, till the fall of *Chandragiri*, the establishment of the Muhammedans in the Karnatik, the conquests of the states of Bījap̄re and Golkonda by the Moguls, and the establishment of the European factories and settlements on the coast, in the commencement of the 17th century, the origin and history of the families of the usurpers of Mysore, Bednore, Chiteldrug, Madura, Raidrug, Harponelly, Ginji, Tanjore, the Northern Vemlavar petty chiefs, &c.; for which considerable materials in original family books, records, histories, inscriptions, grants, &c. are collected, translated, and arranged, forming a necessary prelude to the development of the distracted state

of the country about, or soon after, the period of the settlement of the European nations in India, a clear understanding of, which is perhaps necessary at this day.

7. The ancient history of *Malabar* or *Kerala*, and its singular institutions from materials, MSS., and inscriptions collected in that country.

8. The *history of the Dekkan* under the Muhammedan governments since the 13th century, and a commencement made in opening avenues to its earlier history under the *Hindú* princes. The present state of these countries is still unfavourable to minute investigation.

9. The *ancient geography of India* derives considerable light from these progressive inquiries ; and several explanations are derived of the connexion and extent of commercial relations between the eastern and western continents ; from ancient traditions, remains of establishments, MSS., sculptures, coins,\* and the remains of antiquity scattered in different parts of the country.

10. The *institutions, laws, and peculiar customs* of the various tribes that inhabit India ; the early pastoral, or nomadic tribes ; the agricultural race ; the introduction of arts, sciences, and letters ; the colonies of *Bráhmans* and other tribes successively arriving from the north, from the same unquestionable authority.

11. These are more particularly explained by what has been hitherto unavoidably overlooked—*collection of the ancient sassanams or inscriptions*, on stone, copper, and other metals, still existing in all parts of the country, which prove, by dates and regular formulæ, the early existence of established tenures, and all the regulations of a civilized and cultivated state of society.

12. Collection of *coins*, chiefly *Hindu*, in different parts of the country ; the most remarkable of these are Ro-

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\* In the ruined city of Mahabálipuram in this vicinity, specimens of the Roman and China coinage are found at present, together with other ancient unknown kinds.

man, Chinese, and a singular square kind of silver coins, specimens of which have been found in Hindustán, as well as in the south.

13. Collection of *ancient sculptures* illustrative of the state and cultivation of the arts and sciences, aided by drawings from ancient remains, hitherto unnoticed throughout the peninsula; and in the oriental islands of Java, Bali, &c.

14. Drawings and views of *buildings*, explaining the style and various kinds of architecture.

15. Drawings of the *costume* of the inhabitants of India, and of the Islands; illustrative of descriptions of the several tribes and castes, their peculiar manners, customs, &c. &c.

16. The population and subdivisions of castes ascertained and illustrated by enumeration, by houses, and by families, through the late dominions of Mysore, and in the island of Java; the authenticated tables of which are annexed to the descriptive memoirs of provinces.

(To be continued.)

V.—On the velocity of light.—By ASTRONOMICUS.  
To the Editor of the Madras Journal of Lit. & Science.

SIR,

The attainment of a knowledge of the higher branches of Mathematics so necessary to the study of Astronomy is a difficulty which I apprehend deters many of the otherwise well informed and clever from even a superficial knowledge of this science, with this in view it has of late years been the habit of writers to divest their essays as much as possible if not altogether of any thing like analytical investigation, or in other words *popular treatises* upon the various branches of science have taken the place of more elaborate productions: at first sight it might appear objectionable to allow a loose or taken for granted sort of information to supply the place of a more solid and erudite investigation, but in

practice the contrary has in several instances come under the notice of the present writer ; a superficial knowledge has given rise to curiosity and enquiry, and enquiry has led to study, and thus has led to a knowledge, which but for the curiosity and enquiry excited would never have been attained ; with this position by way of apology, I propose in the following pages (without any attempt at the analytical investigation) to offer some remarks upon the method employed by Astronomers for discovering the velocity of light. There are few or none of your readers perhaps who have not noticed that a sensible interval of time elapses between the flash of a gun as seen from a distance and the report : or between a flash of lightning and the consequent peal of thunder which follows ; but few there are I apprehend who are aware that an interval (a comparatively small one it is true) occurs between the time when the gun actually *did* flash and when the flash *was seen* by an observer situated at a distance : it is true that for any distance on the surface of our Planet the interval is quite inappreciable since it occupies only the twenty-fifth part of a second of time to pass over a distance equal to the Earth's diameter ; hence were our observations confined to terrestrial objects only, the question of the velocity of light would probably never have occupied the attention of the learned, since it never would have been conjectured or even admitted without a proof, that on looking at the sun or any other heavenly body we do not see it in the situation it actually occupies at the moment we see it—suppose for example that a rocket was fired on the surface of the Moon, or that a volcano were to burst out—the phenomena would not be seen by a spectator on the surface of the earth till one second and six tenths after the actual time of bursting, and were the same to occur upon the surface of the sun, the time at which it would be observed on the earth would not be till 8 minutes and 13

seconds after the actual time of its occurrence. But to proceed—The fact of the progressive motion of light was first brought to our knowledge by Roemer who found that the eclipses of the satellites of Jupiter happened sooner or later in the exact proportion of the distance of the satellite from the earth; and at a later date the observations of Bradley upon the fixed stars (which by reason of the earth's motion in her orbit causes their places to appear advanced in the direction in which the earth travels) has confirmed not only the fact, but the numerical accuracy of the determination; the exact determination of the velocity of light it must be recollected is not our present enquiry, since it will lead to formula and figures which are foreign to our present purpose; to supply however in an imperfect way the want of these; we will now proceed to enumerate some of the most important disturbing causes which affect our enquiry. As far back as 1600 Kepler had discovered that the motion of the earth and other planets were not performed in circular orbits, but ellipses; and that the area passed over by a line joining the sun and planet was always proportional to the time, or in other words that the motion was more rapid in the orbit the nearer the planet was situated to the sun—what observation had pointed out to Kepler as the phenomena of nature, the theory of Newton and subsequent Geometers has proved to be the consequences of the laws of universal gravitation—It must be noticed however, that this unequal motion of the planets in their orbits undergoes its changes in the time of one complete revolution of the planet; or to be more particular, if the planet Jupiter (which now more immediately concerns us) in his circuit round the sun performs a certain space in any one day, on the 10th June, 1820 for example it will perform very nearly an equal space on the 10th April, 1832 when it has completed one revolution or come to the same point in its orbit,

it having in the interim gone through all its varieties of rapid and slow movement. Now the effect of a *diminished* motion of Jupiter is to expedite the occurrence, and diminish the duration of the eclipses of his satellites, and an *increased* motion, to retard the same. The next cause of inequality in the interval between the consecutive eclipses of the satellites of Jupiter arises from the elliptical form of their orbits, which, with the secondaries as with the primaries, causes their motions to be unequal; and the interval is further rendered unequal by reason of the *elliptical* figure of *Jupiter* and consequently of his shadow, and by the orbits of the satellites being inclined to the plane of Jupiter's orbit; these being the only serious causes of inequality we will now see how far their effects can be avoided in obtaining an *approximate* value for the velocity of light.

Consulting the Madras observations, we find the observation of two consecutive eclipses of the first satellite as follows:—

| as follows:—                 |           |      |    |    |           |
|------------------------------|-----------|------|----|----|-----------|
|                              | Madras M. | Time | d. | h. | m. s.     |
| Emers. of Jupiter's 1st Sat. | 1821 Nov. | 20   | 14 | 46 | 58.47.    |
|                              |           |      | 22 | 9  | 15.38.91. |

Taking the difference we obtain the interval between the eclipses of the

first satellite. . . . . 1.18.28.40.44.

this result from the various causes above noticed, and the uncertainty of a single observation, is probably several seconds in error, it is however of *some* use as a counter in obtaining a more exact value; thus, from the above source we obtain the following observations:—

|               | d. | h. | m. | s.   |                              |
|---------------|----|----|----|------|------------------------------|
| 1822 March... | 3  | 6  | 48 | 1.9  | Immer. of Jupiter's 1st Sat. |
| 1834 January. | 15 | 10 | 28 | 35.0 | _____                        |

the interval 4336d. 3h. 40m. 33'1s. being divided by the above 1d. 18h. 28m. 40s. 44 shews that between the observation of March 1822 and that of January 1834 there



had occurred 2450 eclipses—which gives for the mean interval between the eclipses of Jupiter's first satellite, 1d. 18h. 28m. 35s. 77 a result which is probably very accurate, for in selecting the above observations care was taken to obtain two which should be made when Jupiter was at very nearly the same part of his orbit, by which means the effect of Jupiter's unequal motion in his orbit is totally avoided—for the remaining causes (of which we will speak presently,) it must be recollected that our result is only affected by 1-2450ths of its amount, so that an uncertainty of one hour would only affect our interval by a little more than one second of time, but since in the end it will appear that 5 or 6 minutes is the extent to which we are liable, we may state that the mean interval between the consecutive eclipses of Jupiter's first satellite, or speaking in Astronomical language, the *Synodic revolution* is performed in 1d. 18h. 28m. 35s. 77. In selecting the first satellite we are led to give it the preference in the first instance in consequence of the rapidity of its motion, which enables us to observe the phenomena to much greater accuracy than can be attained with the other more distant satellites, but more particularly does the first satellite suit our present purpose from the fact that the plane of its orbit is very nearly accordant with the plane of Jupiter's orbit, and farther, that the deviation of the orbit of Jupiter's first satellite from a circle is so small as not materially to affect a result like the present one, which lays claim to but a very limited degree of accuracy: under these circumstances the above result may safely be assumed as the mean time of the *Synodic revolution*; (an interval which we ought to obtain from any two observations made when Jupiter was situated at his mean distance from the Sun.) Now it is plain that in the period of a *Synodic revolution*, the satellite has performed more than one complete, or a *Sidereal revolution*; to compute the time of a *Side-*

real revolution we have the daily motion of Jupiter in his orbit 4m. 59.26s.\* consequently in a Synodic revolution the satellite performs 360d. 4m. 59s. 26 and by the rule of three we find that as 360d. 4m. 59s. 26 : 1d. 18h. 28m. 35s. 77 :: 360d. : the time of a sidereal revolution or 1d. 18h. 27m. 33s. 32 ; or it appears that when Jupiter moves with his mean velocity or at the rate of 4m. 59s. 26 in a day, the satellite after quitting the shadow of Jupiter has to move through a complete revolution and for 1m. 2s. 45 more, until it will again leave the shadow—were the motion of Jupiter in his orbit double of this amount the satellite after completing one revolution would have to travel for 2m. 4s. 90 until it would arrive at the edge of the shadow &c.—thus much being premised we will now consult observation ; for this purpose some observations made at the Madras Observatory are available as follows :—

|                                       | h. m. s.  |
|---------------------------------------|-----------|
| 1834 October 16 Immersion of 1st Sat. | 16·21·41. |
| 1835 March.. 30 Emersion.....         | 9· 7·24.  |
| — April.... 15 .....                  | 7·28· 1.  |

In selecting the above out of a great many, care was taken that the circumstances with regard to distance from the Earth should be as near to the extremes as possible, thus at the first observation the distance of Jupiter from the earth was, miles....387,700,000 at the second. ....526,500,000 — third. ....546,000,000 the above, however, are not the best observations adapted to our purpose, inasmuch as, the first is an observation of the *Immersion* of the satellite into the shadow of Jupiter or the beginning of the eclipse, whereas the second and third are the observation of the *Emersion* or the end of the eclipse, hence it becomes necessary to reduce the

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\* Jupiter performs his Sidereal revolution in 4332 days 14 hours which gives 1' 59" 26 for his daily motion.

former to the tenor of the latter or *vice versa*, to do which we require to know the interval occupied by the satellite to pass over the shadow of Jupiter, for this purpose we must again consult observation ; from the best authorities we find that the first satellite arrives at its greatest elongation from the planet at a distance of 3,034 equatoreal diameters of the planet, or the circumference of the orbit = 19,000 35 diameters, which is performed as we have found above in 1*d.* 18*h.* 27*m.* 33*s.* 32 ; hence 1 diameter is performed in 2*h.* 14*m.* 5*s.* which from the proximity of the satellite to the planet may be assumed as the duration of the eclipses of this satellite—if we now apply this number to the observation of 1834, October, 16 we obtain the time of *Emersion*, 18*h.* 35*m.* 46*s.*—Subtracting the first from the third observation we determine that a certain number of complete synodic revolutions had taken place in 180*d.* 12*h.* 52*m.* 15*s.* 0 which being divided by the time of one revolution shews the number to be 102 ; pursuing the same course with the second and third observations it appears that 9 complete synodic revolutions were performed in 15*d.* 22*h.* 20*m.* 37*s.* Now the times of performing 102 and 9 sidereal revolutions are 180*d.* 10*h.* 50*m.* 38*s.* 64, and 15*d.* 22*h.* 7*m.* 59*s.* 88 respectively, in which periods (see the *Nautical Almanac*) Jupiter has advanced in his orbit 14° 27' and 1° 23' respectively, and the times necessary for the satellite to perform these angles are 1*h.* 42*m.* 15*s.* 3, and 9*m.* 47*s.* 3, which added to the above times of performing the sidereal revolutions gives 180*d.* 12*h.* 32*m.* 53*s.* 9 and 15*d.* 22*h.* 17*m.* 47*s.* 18 for the true interval between the eclipses which were observed as above, whereas on account of the progressive motion of light the observations in each case were observed later by 19*m.* 21*s.* 1 and 2*m.* 49*s.* 82. Now in the interval between the first and third observation Jupiter had increased his distance from the earth 158,300,000

miles and between the second and third 19,500,000 miles; the former giving the time for light to pass over 95 millions of miles (the distance from the sun to the earth) 11m. 36s. 8 and the latter 13m. 47s. 4 : the discordance between these results appears to arise mainly from an error of about 40 seconds in the third observation, but this in no way interferes with the intentions of this sketch which aims at merely a *rude* description of the *modus operandi*, (and a very rude one it is too!) and not to determine from three observations the value of an element which is already known from the result of thousands.

ASTRONOMICUS.

VI.—*Calculation of all the occultations visible at Madras during the present year.*—By GODAY

VENKAT JUGGAROW.

*To the Editor of the Madras Journal*

*of Literature and Science.*

SIR,

The handsome reception which you gave my tables on a former occasion has encouraged me to make a further attempt—accordingly in the following pages I have given the result of my calculation of all the occultations which will be visible at Madras during the present year, and beg you will kindly give them insertion in your excellent Journal.

As the accuracy of calculation depends upon the method employed, I here annex the formula and an explanation to enable the enquirer to ascertain the correctness attained.

The assumption made is, that the motions of the Moon in right ascension and declination combined with the effects of parallax is equable for the interval of an hour, and this is not very far from being the case, thus—

|  | h. m. Moon's A. R. | h. m. Moon's A. R.  |
|--|--------------------|---------------------|
| On 9th June at 11.35 15 57.46.05 and at 12.35 16. 0.19.64. |                    |                     |
| Apply the Parallax   | 0.52.15            | — 1.56.15.          |
| Apparent A. R...   | <u>15.56.53.90</u> | <u>15.58.23.49.</u> |
| Apparent horary motion...                                  | 1.29.59.           |                     |
| On 9th June at 14. 3 16. 4. 0.97 and at 15. 3 16. 6.35.61. |                    |                     |
| . Apply the Parallax                                       | —1.13.61           | — 2.12.64.          |
| Apparent A. R...   | <u>16. 2.47.36</u> | <u>16. 4.22.97.</u> |
| Apparent horary motion...                                  | 1.35.61.           |                     |

Hence we find that in an interval of nearly three hours the variation of the hourly motion is only 6s., 02 or 2s. an hour and  $\frac{1}{8}$  of this or 0s., 25 is the greatest correction for second differences; but the Moon's apparent horary motion in right ascension being about  $1\frac{1}{2}$ m. an error of even one second will not alter the predicted time of occultation more than a minute.

Now to find the times of Immersion and Emersion it only remains for us to determine the apparent place of the Moon and its horary motions, from which, we may compute the two instants when the distance of the centre of the Moon and star is equal to the semi-diameter of the Moon, thus—

Find from the Nautical Almanac or any other Ephemerides the time when the Moon is in conjunction in right ascension with any proposed star together with the difference of declination of the Moon and star at that moment, then compute the corresponding sidereal time, the moon's right ascension and declination, and the hourly variation; then the sidereal time—the Moon's right ascension will be = the Moon's hour angle, which will either be + or — as the situation of the Moon is to the west or east of the meridian.

It is evident that to a spectator on the surface of the Earth the apparent conjunction in right ascension happens sooner than the true as seen from the centre of the

Earth when the hour angle is— and later when +, therefore to determine the apparent hourly motions at apparent conjunction assume two instants; first the time of true conjunction in right ascension and the 2d + or — one hour from the first according to the sign of the hour angle; compute the Parallax in right ascension and declination at these two instants,

Then making

$\Lambda$  = the Moon's right ascension at 1st instant.

$D$  = the Moon's declination at 1st instant.

$a$  = the true hourly motion in right ascension.

$d$  = the true hourly motion in declination.

$a$  the apparent hourly motion in right ascension.

$d$  „ „ in declination.

—when proceeding to the north and + when to the south.

$\Delta$  = the difference of declinations at conjunction.

$\Delta'$  = apparent difference of declinations at apparent conjunction + when the Moon is N and — when south of the star.

$p'$  = the parallax in right ascension at the 1st instant.

$p''$  = „ „ at the 2d instant.

$P$  = „ in declination at the 1st instant.

$P$  = „ at the 2d instant.

$t$  = the time from the true to the apparent conjunction.

$\Lambda + p'$  = the apparent right ascension at the 1st instant.

$\Lambda + a + p''$  „ „ 2d instant.

$a' = a + p' - p''$  = apparent hourly motion in right ascension similarly.

$d' = d + P - P'$  = apparent hourly motion in declination:

The difference of the apparent right ascensions of the Moon and star at the 1st instant will be  $p'$ , and  $t$  the time of the Moon describing this space will be  $t = \frac{p'}{a'}$

$$\frac{p'}{a + p - p'}$$



the angle  $d a x$  (which we will call  $O$ ) being the inclination of the star's apparent orbit to the circle of declination; to compute it, we have

$$\begin{aligned}\tau O &= \frac{e b}{a b} \\ &= \frac{d}{a \cos D}\end{aligned}$$

$$\begin{aligned}c x \text{ being given} &= \Delta' \\ x c n &= O \bullet\end{aligned}$$

$$c n \text{ or } n \text{ the neareast approach will be} = \Delta' \cos O$$

$$\text{And } t' \text{ the time describing } x n \text{ will be} = \frac{n \sin O}{a' \cos D}$$

for in the triangle  $c x n$

$$\begin{aligned}x n &= c x \sin x c n \\ &= \Delta \sin O\end{aligned}$$

$$a c : 1 :: \Delta' \sin O : t'$$

$$\therefore t' = \frac{\Delta' \sin O}{a b}$$

$$\text{But } a e = \frac{a' \cos D}{\cos O}$$

$$\text{therefore } t' = \frac{\Delta' \cos O \sin O}{a \cos D} = \frac{n \sin O}{a \cos D}$$

Now the time of apparent  $\sigma$  in right ascension  $+ t'$  ( $+$  when  $\Delta'$  and  $d$  are of like signs and  $-$  when contrary) = time of nearest approach, or the middle of the occultation.

If  $y$  represent the place of Immersion, the time of the star describing  $n y$  will be the semi-duration, to determine which we have  $c y = S$  the Moon's semi-diameter  $c n = n$  the nearest approach and by the 47th of the 1st Book of Euclid  $\sqrt{s^2 - n^2} = n y \mid s + n \mid \mid s - n \mid \mid$



$$\frac{a' \cos D}{\cos O} : 1 :: \left| s + n \right| \cdot \left| s - n \right|^{\frac{1}{2}} : \sigma \text{ the semi-} \\ \text{[duration]} \\ \therefore \sigma = \frac{\left| s + n \right| \cdot \left| s - n \right|^{\frac{1}{2}} \cos O}{a \cos D}$$

Time of nearest approach  $\left\{ \begin{array}{l} + \sigma = \text{the time of Emergence.} \\ - \sigma = \text{the time of Immersion.} \end{array} \right.$

The following example will sufficiently illustrate these observations—

I find from the nautical Almanac that on the 9th June  $w^2$  Scorpii will be occulted; the following are the elements.

|                |                              |
|----------------|------------------------------|
| h m s          |                              |
| 11. 35. 14.    | Madras Mean Time of $\sigma$ |
|                | Right Ascension.             |
| 16. 44. 47. 93 | — Siderial Time of $\sigma$  |

+ 0, 47. 1. 88  $\epsilon$ 's hour angle

h m s

A = 15. 57. 46. 05

0 ' "

D = 19. 50. 45. 6

$\Delta$  = — 0. 34. 17. 0

m s

a = + 2. 33. 59

' "

d = + 10. 56. 9

m s

p' = — 0 52. 15

p'' = — 1. 56. 15

P' = + 33. 4. 1

P'' = + 31. 29. 7

$$a' = a + p'' - p' = \overset{\text{m s}}{2. 33. 59} - \overset{\text{m s}}{1. 56. 15} + \overset{\text{m s}}{0. 52. 15} =$$











